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1,547,871

J. GRÜNBERG

APPARATUS FOR THE PRODUCTION OF ARTISTIC PRINTS AND IMPRESSIONS

Filed March 23, 1925

2 Sheets-Sheet 1

Fig. 1.

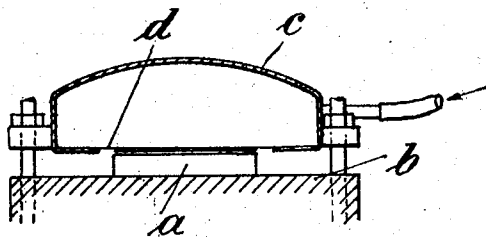


Fig. 2.

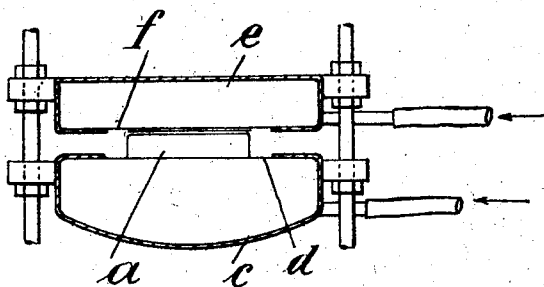
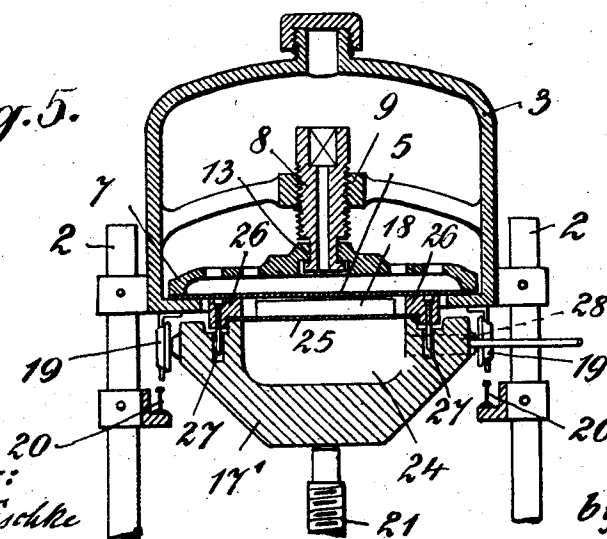


Fig. 5.



Witnesses:
Paulus Pischke
Alto Lehmann

Inventor:
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 Attorney.

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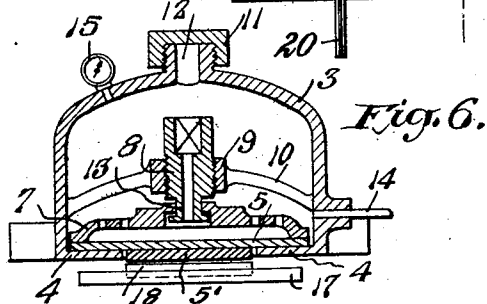
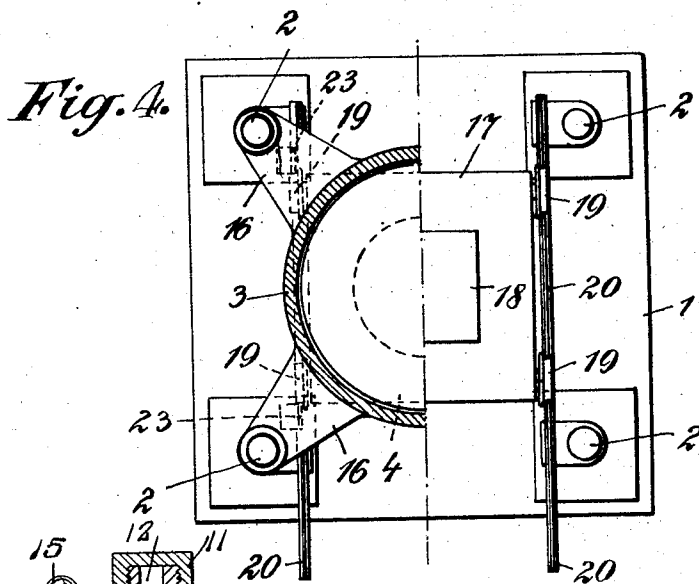
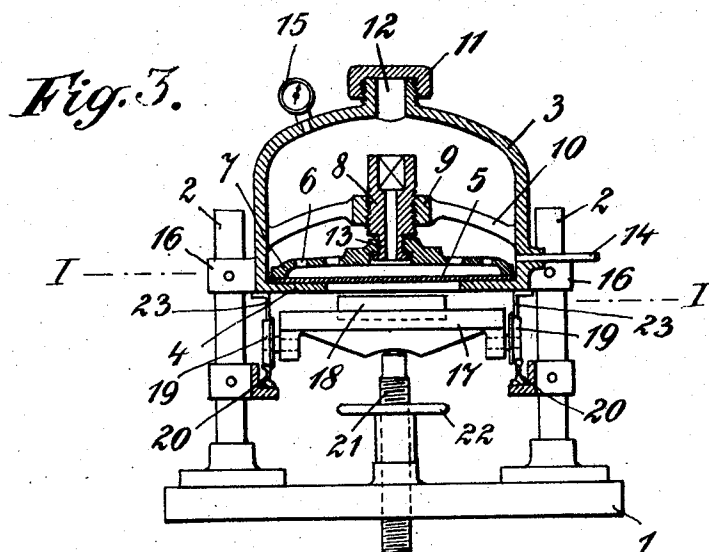
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APPARATUS FOR THE PRODUCTION OF ARTISTIC PRINTS AND IMPRESSIONS

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

JOSEF GRÜNBERG, OF BERLIN, GERMANY.

APPARATUS FOR THE PRODUCTION OF ARTISTIC PRINTS AND IMPRESSIONS.

Application filed March 23, 1925. Serial No. 17,810.

To all whom it may concern:

Be it known that I, JOSEF GRÜNBERG, formerly a citizen of Russia, and at present having no status as a citizen of any country, and residing at Berlin, Germany, have invented certain new and useful improvements in Apparatus for the Production of Artistic Prints and Impressions, of which the following is a specification.

My invention relates to an apparatus for the production of artistic prints and impressions.

Pressure processes hitherto used in the graphic arts have the disadvantage that the original, whether it be a copper form, a lithographic stone or a wood block, from which the prints are prepared quickly becomes useless. Hence most valuable original works are lost, only the first few prints being good, while the remaining prints fail to show all the beauties of the original. This is because the hard press plate or roller under the high pressure of the press wears away or flattens the finest parts of the original after a short time, so that the drawing becomes blurred. It also frequently happens that the press pressure of the rigid plate or roller in consequence of warping, tilting, or the like gives the drawing different strength in different places, whereby a faulty copy is produced.

A further disadvantage has existed hitherto in that for engravings, lithographs and wood cuts a special press was necessary for each; moreover, the processes apart from the above mentioned disadvantages were very elaborate and expensive.

The disadvantages mentioned are eradicated by the apparatus according to this invention and moreover a press is provided which may be used for all kinds of printing.

According to my invention the yielding material or object to be pressed or printed upon and the original piece (press block, stone, or the like) consisting of unyielding material are pressed against one another by the movement of one or more elastic walls under hydraulic or pneumatic pressure.

It has already been proposed to apply compressed air directly to the rear side of the material to be pressed. In this known arrangement however the material to be pressed must be sealed to the open air cylinder, whereby a damaging tension and waste

is set up. Of itself it is naturally a great disadvantage if in carrying the pressure process into effect the material to be pressed must form a part of the pressure device. This disadvantage is overcome by the apparatus according to my invention in which the material to be pressed lies quite freely upon the original plate.

The apparatus according to my invention also gives the advantage that for the original plate materials such as glass, porcelain and so forth can be used, which could not be used previously owing to their brittleness, but which are particularly suitable for fine work.

In consequence of the elastic steady pressure obtained all parts of the picture are equally pressed and no wear on the original plate is occasioned, so that many points of similar quality and delicacy to the drawing can be produced. The press pressure can also be adjusted for desired fineness of the lines.

The accompanying drawings illustrate in Figs. 1 and 2 several arrangements whereby the invention may be carried into effect. Fig. 3 shows one form of construction of a press according to my invention, in vertical section. Fig. 4 is a horizontal section on line I—I of Fig. 3. Fig. 5 shows in vertical section a second example of this kind of press, and Fig. 6 shows a further example also in vertical section.

According to Fig. 1, the original piece *a* lies upon the rigid base *b* which can be raised and lowered in guides. Above the original piece *a* is a pressure container *c* which is closed on its lower side by a membrane *d*. If now the container *c* is filled with compressed air or liquid the membrane *d* is bulged out and presses the leaf lying on the original piece quite evenly thereagainst.

According to Fig. 2, the original piece *a* lies upon the membrane *d* closing the container *c*. Above the original piece is situated a second container *e*, which is closed on its lower side by a membrane *f*. The upper container is now filled with a liquid and remains at about atmospheric pressure. The lower container *c* is at the same time inflated with air or liquid under pressure, whereby the leaf lying upon the piece *a* is pressed against the upper membrane *f* in

consequence of the bulging of the membrane *d*.

It is immaterial whether the upper or lower container is raised and lowered for changing the leaves or sheets to be printed.

The press shown in Figs. 3 and 4 consists of a base plate 1 having four vertical supports 2, which carry the upper and lower press portions. The upper portion consists of a cylindrical hood 3 with fluid leads 14 and pressure gauge 15. The lower opening of the container 3 is covered by a rubber plate 5, and a plate 7 serves for tightly sealing this plate 5 against the inwardly projecting lower rim 4 of the container 3. The plate 7 is suspended from a screw spindle 8 which can be screwed within a fixed nut 9 carried by a bridge 10. The adjustment of the screw spindle 8 and therewith the plate 7 is effected by means of a key which may be inserted in an opening 12 provided with a closing cap 11. Upon screwing down the spindle 8 the outer rim of plate 7, which can move freely upon the neck 13 of the spindle 8, is pressed tightly against the underlying rim 4. The outer rim surface of the plate 7 can also be conical interiorly so that it presses into the rubber plate with a wedge-like action.

The container 3 is carried by the bosses 16 upon the supports 2, upon which it is vertically adjustable.

The lower portion consists chiefly of a press table 17 upon which lies the original piece or matrice 18. The table 17 is provided with four supporting wheels 19 which rest on running rails 20 carried by the vertical supports 2.

After the rubber plate 5 has been pressed upon by the plate 7 a liquid, for example oil or water, is introduced into the container 3 and placed under pressure. The press table 17 with the original piece 18 lying thereon and the leaf to be pressed placed upon this is previously raised by means of a lifting spindle 21, which is rotated by the hand-wheel 22, just so high that the original piece 18 with the leaf to be pressed rests against the rubber plate 5. The supporting wheels 19 slide in vertical guides 23 which are secured on the underside of the container 3 and ensure correct positioning of the table for all directions.

Since the plate 7 is provided with apertures 6 the fluid in the container 3 operates upon the rubber plate 5 and thereby presses the material lying directly therebeneath quite evenly against the original piece, thereby printing off the copy.

The pressure gauge 15 can be provided with an electrical device for indicating a definite pressure.

After printing the copy the table 17 is again lowered till the supporting wheels 19 rest on the rails 20. On the latter the

table 17 is drawn out of the press and a new copy prepared. The backward movement of the table 17 is limited by the rear guiding rails 23 which reach down almost to the running rails 20.

With original pieces of easily broken material it is preferable to make the underlying base of the original piece elastic also. Fig. 5 illustrates such a press. The press table 17¹ presents a hollow chamber 24 which is covered by an elastic membrane, for example a rubber plate 25, upon which lies the original piece 18. On the rim of the rubber plate 25 lies a ring 26 which is guided vertically by means of pins 27 or in other suitable manner upon the press table 17¹, in order to be able to press the rubber plate 25 firmly against the table top. The hollow chamber 24 is filled with liquid through an opening which is closed by means of a plug 28 and is at about normal atmospheric pressure. If the container 3 is filled with liquid under pressure it presses the rubber plate 5 not only against the original piece 18 but also against the ring 26 whereby the hollow chamber 24 is sealed.

The adjustment and operation of the press in Fig. 5 is substantially the same as for the press shown in Figs. 3 and 4.

Upon using the press according to my invention it is important to have hermetically sealed not only the pressure container 3 by means of the membrane 5, but also in example shown in Fig. 5 the fluid chamber 24 by means of the membrane 25. For this purpose plate 7 which presses upon the outer rim of the membrane 5 is so arranged upon the neck 13 of the screw spindle 8 that upon bulging out and thinning of the membrane 5 under pressure the plate 7 can slide under the action of the pressure thereon, so that the sealing is completely maintained. For the same reason the ring 26 which lies upon the rim of the membrane 25 under pressure of the upper membrane 5 completely follows the yielding of the membrane 25.

With the presses according to Figs. 3-5 the work piece (paper sheet or like) cannot be greater than the space enclosed by the flange 4 on the pressure container 3, because the work piece must be driven within the flange and against the membrane 5. In order to enable work pieces of desired size to be pressed, in the example shown in Fig. 6 the membrane 5 is provided with a reinforcement 5¹ which advantageously consists of elastic material, such as rubber, and is so thick that its outer surface, which constitutes the actual pressure surface, lies adjacent the outer edge of the projecting rim 4. The pressure plane then lies no longer within, but without the flange 4. The reinforcement can be integral with the rubber plate 5. It may be preferable, as the rubber

plate 6 consists of relatively thin material, to attach one or more rubber layers or canvas insertion pieces to the rubber plate 5.

The reinforcement 5¹ has moreover the advantage that the plate 5 bulges only a very little in use and therefore is not subjected to heavy demands, its serviceable life being very long.

I claim:

10 1. Apparatus for production of artistic prints and impressions, comprising in combination, a table for carrying the original piece and the material to be pressed, a pressure container open at one side, an inward-
15 ly projecting rim at the open side of said container, an elastic membrane arranged within said container and adapted to close the latter, means for tightly sealing said elastic membrane against the inner side of
20 said rim, an elastic reinforcement on said elastic membrane and having its outer face arranged outside the rim of said container.

2. Apparatus for production of artistic prints and impressions, comprising in combination, a table for carrying the original
25 piece and the material to be pressed, a pressure container open at one side, a membrane adapted to close the open side of said container, said table being formed as a container open at its upper side, a second mem-
30 brane arranged to close the open side of said table and to support the original piece and the material to be pressed, a ring vertically movable and being arranged to hold said

membrane in position, means for producing hydraulic or pneumatic pressure in the first container and thereby pressing the first membrane against the material to be pressed and against said ring.

3. Apparatus for production of artistic prints and impressions, comprising in combination, a table for carrying the original piece and the material to be pressed, a pressure container open at one side, a membrane adapted to close the open side of said container, a ring for tightly sealing the rim of said membrane against its seat, said ring being arranged to slide along a guide, said table being formed as a container open at its upper side, a second membrane arranged to close the open side of said table and to support the original piece and the material to be pressed, a ring vertically movable and arranged to hold said membrane in position, means for producing hydraulic or pneumatic pressure in the first container and thereby pressing the first membrane against the material to be pressed and against said ring, means for raising and lowering said table, and means for holding said table in printing position.

In testimony whereof I have affixed my signature in presence of two witnesses.

JOSEF GRÜNBERG.

Witnesses:

ULAD ENDEY,
ROY V. FOX.