

Sept. 4, 1923.

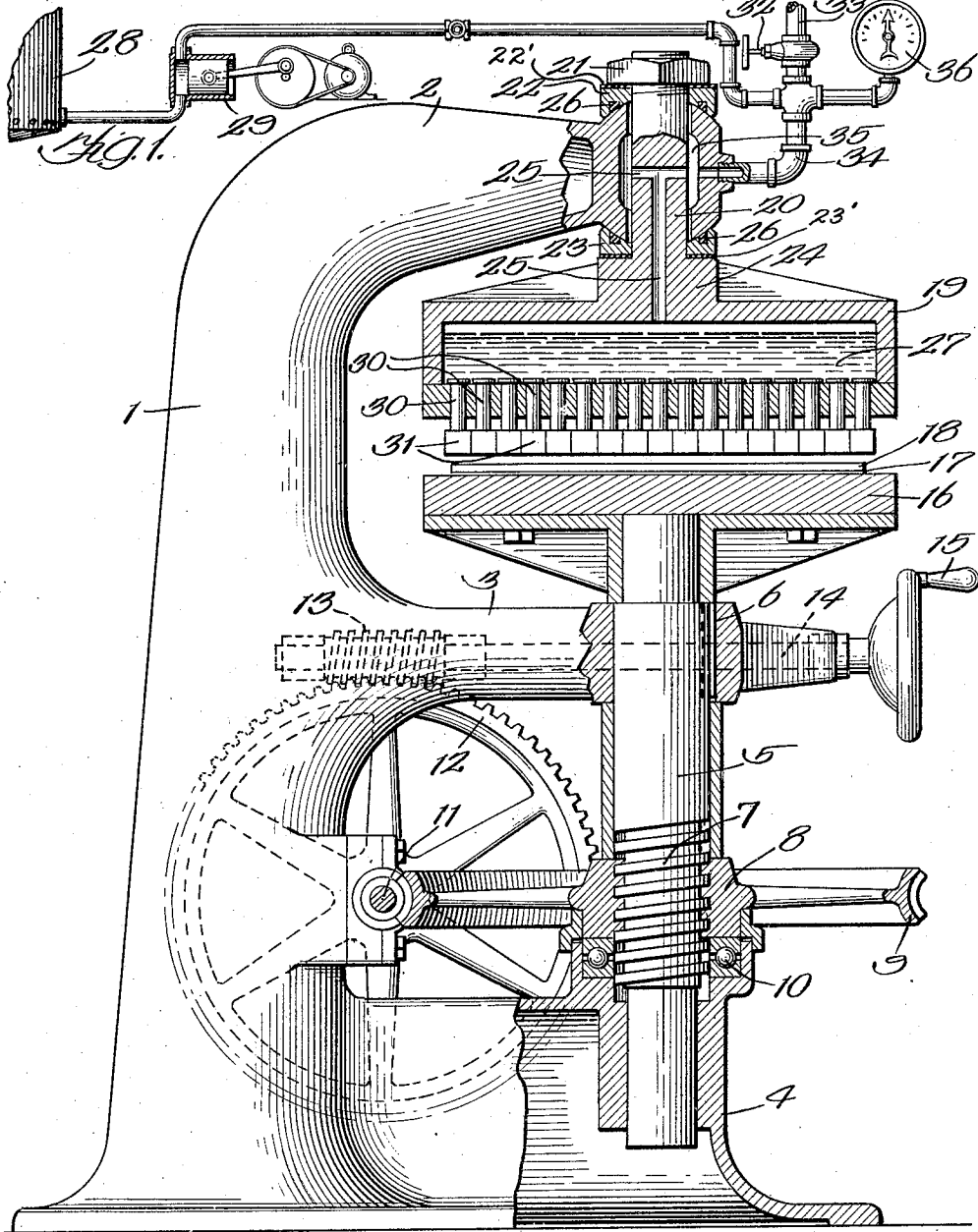
1,466,730

F. N. SANFORD

PRESS

Filed Nov. 28, 1921

2 Sheets-Sheet 1



Inventor:
Floyd N. Sanford
By *G. H. Gray* Atty.

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2 Sheets-Sheet 2

Fig. 2.

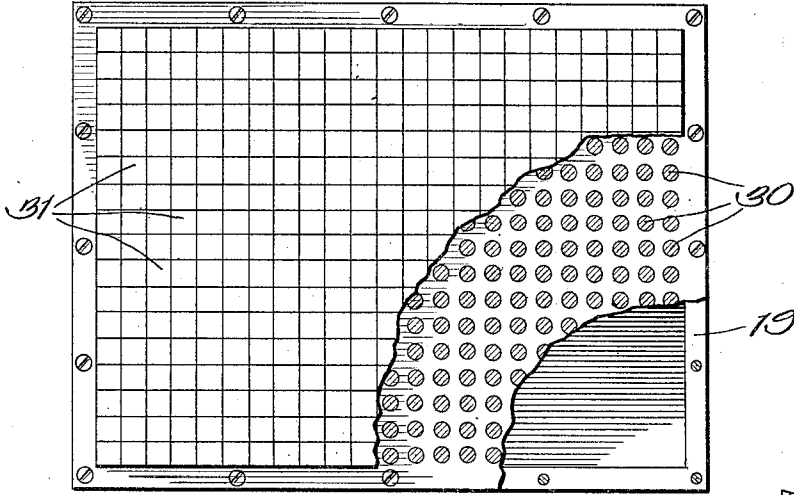


Fig. 4.

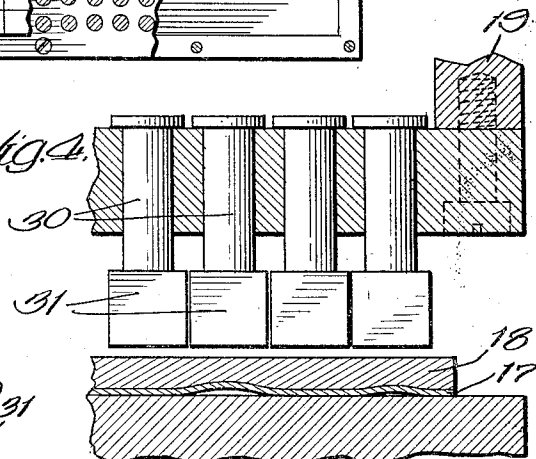


Fig. 3.

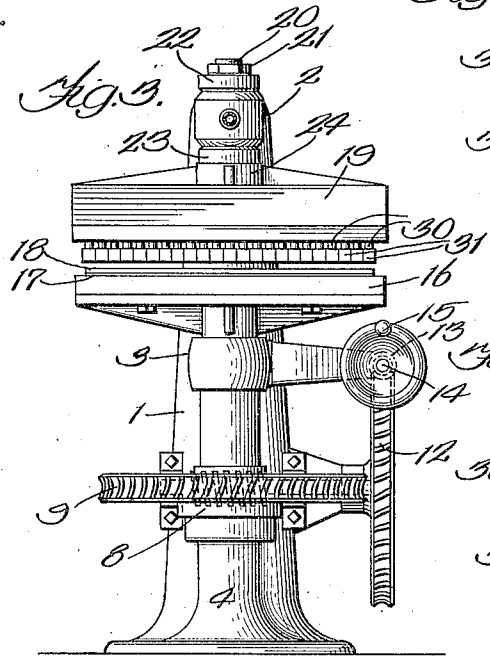
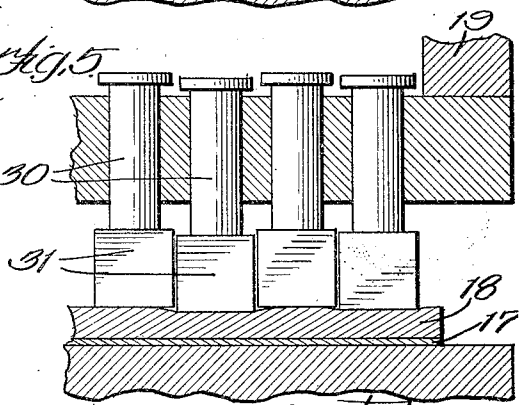


Fig. 5.



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UNITED STATES PATENT OFFICE.

FLOYD N. SANFORD, OF CHICAGO, ILLINOIS, ASSIGNOR TO HACKER MANUFACTURING CO., OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

PRESS.

Application filed November 28, 1921. Serial No. 518,166.

To all whom it may concern:

Be it known that I, FLOYD N. SANFORD, citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Presses, of which the following is a full, clear, concise, and exact description.

My invention relates to presses and is of particular service in removing the inequalities in the printing faces of electrotype plates, although the invention is not to be limited to any particular use to which it may be put.

In carrying out my invention I employ a press that includes two members between which the object to be pressed is disposed one of these members having a plurality of individually movable presser feet. The copper plate or other object is interposed between these presser feet and the complementary member of the press and these presser feet may be suitably and individually applied to the copper plate with pressure that is necessary properly to correct the plate.

In the preferred embodiment of the invention means for exerting pressure upon the presser feet is common to the presser feet and is of such a nature that the pressure exerted upon all of the feet is uniform.

The medium through which pressure is applied to the presser feet is preferably a body of fluid such as oil which is contained within a receptacle having holes through one of its walls in which the stems of the feet have sliding fluid tight engagement with such wall. The oil is contained in this receptacle and any suitable means are employed for imparting resilience to the oil to constitute it a resilient cushion through which the pressure is applied upon the feet. In the preferred embodiment of the invention, a body of air or other gas trapped within the receptacle will answer the purpose, though it is quite apparent that a pump may be employed to force the oil against the presser feet, the pump yielding as the feet are applied to their work to afford the necessary resilience or yielding quality in the oil to permit relative movements of the presser feet which individually adapt themselves to the inequalities in the plate pressed upon thereby.

I will explain my invention more fully

by reference to the accompanying drawings showing the preferred embodiment thereof and in which Figure 1 is a view partially in elevation and partially in section of a press equipped in accordance with the invention; Fig. 2 is a bottom view of the presser feet supporting member of the press with portions broken away; Fig. 3 is a front elevation of the press on a smaller scale than that employed in Fig. 1; and Figs. 4 and 5 are sectional views illustrating the results accomplished in connection with an electrotype plate. Fig. 4 showing the presser feet before they are applied to the plate and Fig. 5 showing these feet after they are applied to the plate.

Like parts are indicated by similar characters of reference throughout the different figures.

The framework of the press may be of any suitable form, it preferably including an upright standard portion 1, arms 2 and 3 projecting laterally from said standard portion and a base portion 4 beneath the arms. The arm 3 and the base 4 have co-axial upright cylindrical openings at the parts thereof which are remote from the standard 1. A vertical shaft 5 is slidable up and down in these cylindrical openings, there being a key or spline 6 for preventing rotation of the shaft so that it may be confined to rectilinear movement only, although the invention is not to be thus restricted.

The shaft is threaded at 7 to have threaded engagement with the hub 8 of a worm gear wheel 9. This hub rests upon a ball step bearing 10 which is carried upon the base 4. The worm gear wheel 9 is in mesh with a worm that is co-axial with and fixed with relation to the worm gear wheel 12 which is carried upon the shaft 11. A worm 13 is in mesh with the worm wheel 12 and is fixed upon a shaft 14 provided with a crank 15 for turning it. The upper end of the shaft 5 carries a table 16 that constitutes one of the two pressure exerting members of the press. By turning the crank 15 the shaft 5 may be elevated or lowered to effect corresponding elevation or depression of the table 16. The printing plate or other object to be pressed is placed upon this table, the printing plate shown including the copper plate portion 17 and the lead backing 18.

The pressure exerting member of the

press that is complementary to the table 16 is carried upon the outer end of the arm 2. As illustrated, this complementary pressure exerting member constitutes the head of the press and is inclusive of a fluid containing receptacle 19 having a stem 20 threaded at its upper end to receive a nut 21 by which the press head 19 is assembled with the balance of the press. The head supporting end of the arm 2 is globularly curved at its top and bottom. A washer 22 is interposed between the nut 21 and the top curved portion of the arm 2 and the washer 23 is interposed between the bottom curved portion of the arm 2 and the enlarged portion 24 of the stem 20. When the nut 21 is loosened the head 19 is made level with respect to the table 16 by elevating the table until it is in full contact with said head 19 whereafter the nut 21 is tightened.

The head 19, being in the form of a fluid containing receptacle, is provided with passages 25 through the stem 20 for the flow of fluid between the receptacle interior and the exterior of the press and in order that this fluid may not leak from the press at the washers 22 and 23 these washers are provided with fluid tight packings 26 that engage the arm 2. The thin washer 22' between the parts 21 and 22 and the thin washer 23' between the parts 23 and 24 serve further to render fluid tight the connection between the arm 2 of the press and the press member adjustably supported thereon. The liquid that is employed in the hollow head 19 is indicated at 27, being preferably oil and may be supplied to the interior of the head through the passages 25 in the head and from any suitable source 28 from which the oil may be forced to the hollow head by a pump 29. The bottom wall of the head is provided with a large number of equidistant openings therethrough each containing the stem portion 30 of a presser foot 31. These stems are in sliding fluid tight engagement within these openings so as to prevent the oil from passing through such openings. If the pressure exerting member of the press that is provided with the presser feet is uppermost the stems 30 preferably have enlarged ends that are within the interior of the head 19 to prevent the presser feet from dropping out. Other means may be employed for maintaining the assembly of the presser feet and the balance of the head 19 if desired. The presser feet 31, proper, are desirably of cubical formation and are closely assembled mutually to co-operate in preventing them from being twisted.

These presser feet may have pressure exerted thereon in a variety of ways. For example, the interior of the head may be only partially filled with the oil, the balance containing air or other gas, escape of the air

to the exterior atmosphere being prevented by closure of the valve 32 in the pipe 33 which communicates with the pipe 34 that itself is in communication with the space 35 within the outer end of the arm 2 and surrounding the stem 20 to have communication with the passage 25.

The requisite amount of liquid and air having been trapped within the head 19 by the closure of the valve 32, the table is raised by operating the crank 15 until the desired degree of pressure has been exerted, this pressure being effected by the displacement of the liquid caused by the stems 30 rising within the head 19, the pressure exerted being indicated by the gauge 36. In another method the pressure may be exerted by the liquid operating without conjunction with the air, in which event the entire interior of the head 19 and all of the passages and pipes in communication therewith are completely filled with the liquid, the table having been raised, before the liquid is permitted to exert any pressure, sufficiently to raise the presser feet. The object to be pressed being in engagement with the raised presser feet, the pump 29 is started into operation to apply pressure to the liquid within the head 19 to the extent desired, the degree of pressure exerted being indicated by the gauge 36, the valve 32 being closed. If there are any inequalities in the object being pressed upon the presser feet engaging such inequalities will be raised or lowered, the piston of the pump permitting any required displacement of the liquid if the elevated stems of the presser feet have reduced the liquid holding capacity of the head 19, the pump piston thus serving the purpose which a body of air trapped within the hollow head would perform under like circumstances, the piston yielding or advancing according to the increase or decrease in the liquid holding capacity of the head due to change in positions of the presser feed stems.

The press of my invention is of particular service in flattening or otherwise making the printing faces of electrotype plates to conform to the proper printing position that such faces should have. In the manufacture of electrotypes inequalities, such as those diagrammatically indicated in the plate 17 of Fig. 4, frequently appear and which hitherto have been hammered out by skilled artisans at much expense. These inequalities are effaced by the presser feet of the press of my invention.

Before the electrotype plates are treated in the press of my invention they are provided with the usual lead or other soft metal backing 18 and, thus provided, they are placed upon the table 16. If the body of air is trapped in the hollow head 19 the table 16 is elevated until the presser feet stems 30

have displaced sufficient liquid to smooth out the inequalities in the copper plate portion 17 of the electrotype. The pressure exerted is indicated by the gauge 36 and is ultimately increased to a point that is sufficient to enable the presser feet that are in register with the inequalities to efface such inequalities and yet is not sufficient to damage the plate where the other presser feet are in register with portions of the plate that are already correct. It will be apparent that the pressure applied to the presser feet is equal throughout and is not excessive at any place upon the electrotype. If the liquid is to be pumped into the head until the requisite degree of pressure is effected, the table is raised to a place where the presser feet stems are elevated before any pressure is applied whereafter the pump is started into operation with the results which have been described.

While I have herein shown and particularly described the preferred embodiment of my invention I do not wish to be limited to the precise details of construction shown as changes may readily be made without departing from the spirit of my invention, but having thus described my invention I claim as new and desire to secure by Letters Patent the following:—

1. A press including two members between which the object to be pressed is disposed, one of these members having a plurality of individually movable presser feet; a liquid element common to and arranged to exert substantially equal pressure upon said feet; and a closed receptacle for said liquid, this receptacle also containing gas to furnish an elastic backing for the liquid.

2. A press including two members between which the object to be pressed is disposed,

one of these members having a plurality of individually movable presser feet; a liquid element arranged to exert pressure upon each presser foot; and a closed receptacle for said liquid, this receptacle also containing gas to furnish an elastic backing for the liquid.

3. A press including two members between which the object to be pressed is disposed; and mechanism for forcing movement of one of said members toward the other, one of said members including a plurality of individually movable presser feet and a resilient fluid cushion composed of liquid and gas and which is common to and backs said presser feet and through which pressure is exerted upon said feet.

4. A press including two members between which the object to be pressed is disposed; mechanism for forcing movement of one of said members toward the other, one of said members including a plurality of individually movable presser feet and a fluid body common to and backing said presser feet and through which pressure is exerted upon said feet; and a resilient backing for said body.

5. A press including two members between which the object to be pressed is disposed; mechanism for forcing movement of one of said members toward the other, one of said members including a plurality of individually movable presser feet and a liquid body common to and backing said presser feet and through which pressure is exerted upon said feet; and a resilient backing for said body.

In witness whereof, I hereunto subscribe my name this 25th day of November A. D., 1921.

FLOYD N. SANFORD.