Feb. 14, 1933. W. HEINECKE 1,897,757

PROOF PRESS

Filed Dec. 26, 1930

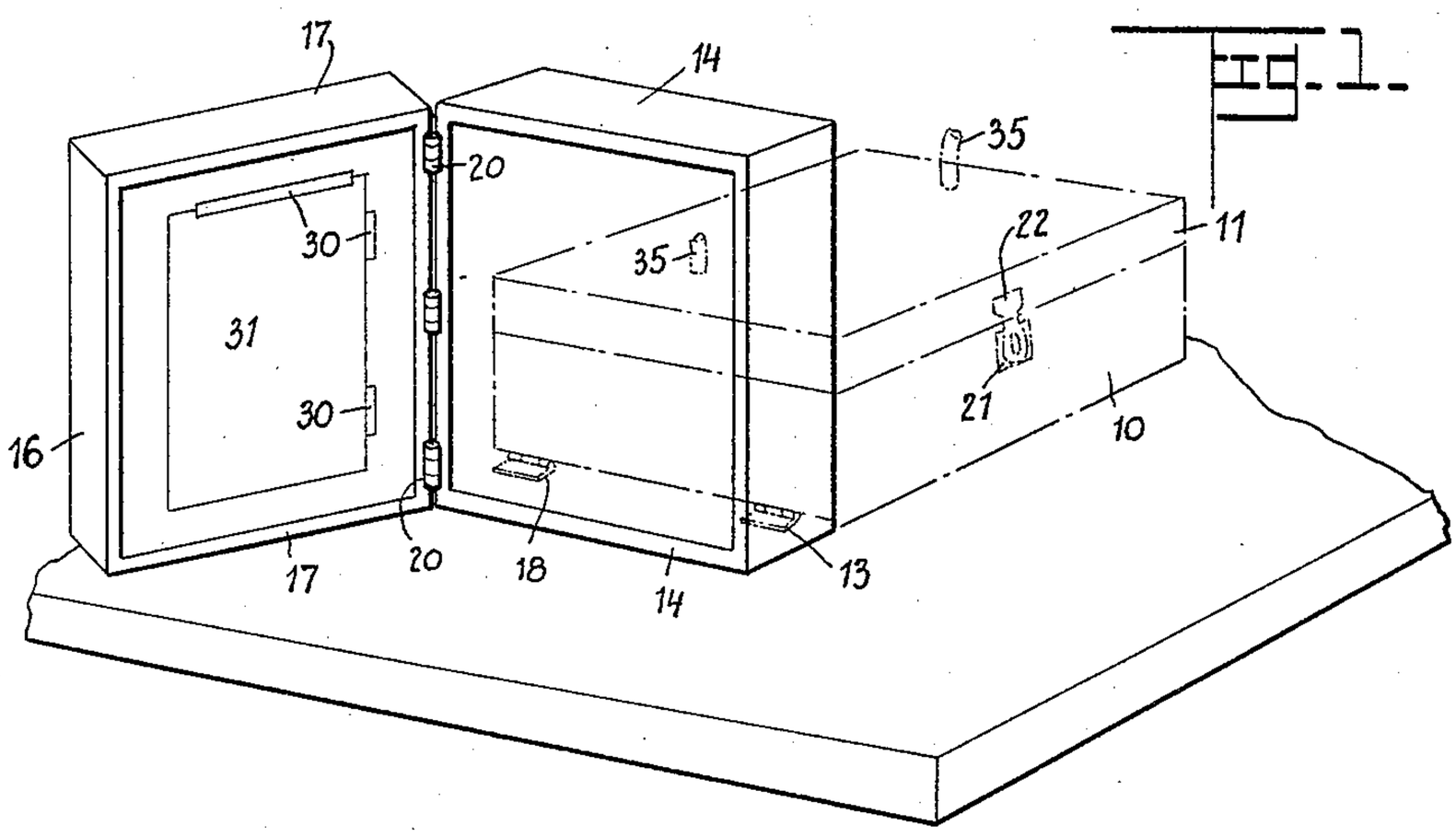

Fig. 1.

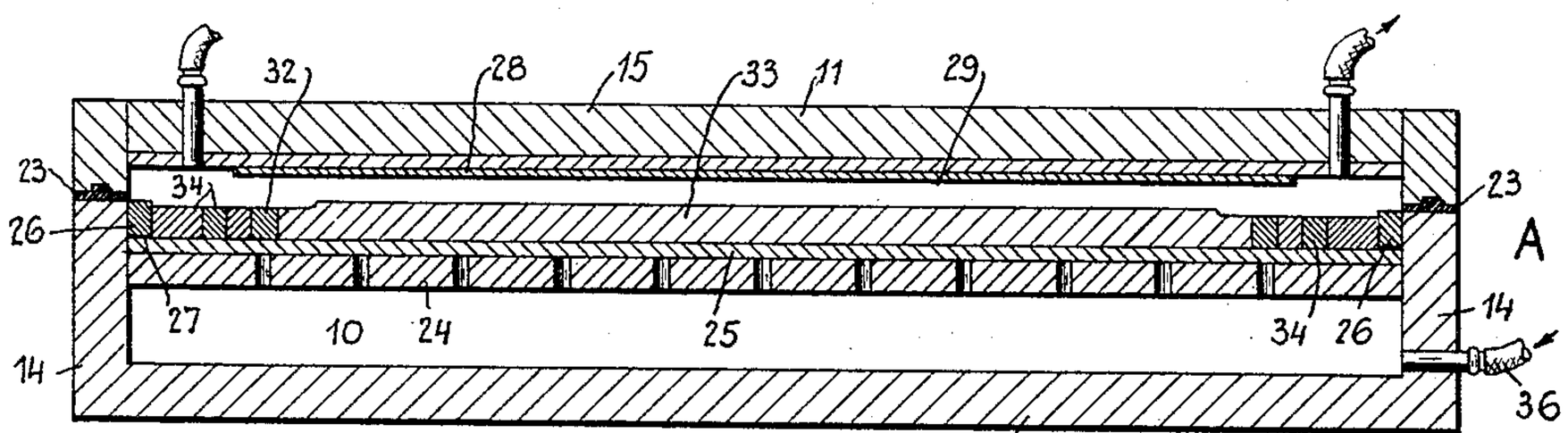

Fig. 2.

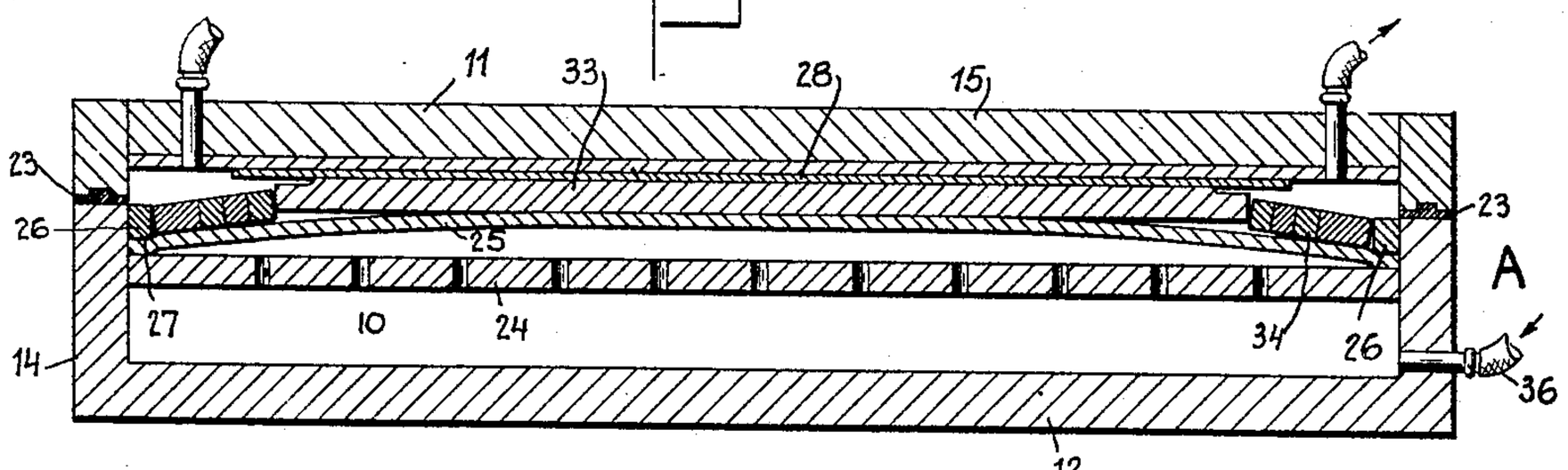

Fig. 3.

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PROOF PRESS

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This invention relates to the art of printing, and has particular reference to a proof press embodying a novel combination and arrangement of elements, and a novel mode of operation, designed to apply an even or uniform pressure of the printing form against the sheet, whereby the necessity of employing a so-called "make ready" may be eliminated and whereby correct press proofs or impressions may be produced expeditiously and at relatively low cost.

With the foregoing general purpose in view, the invention consists in the novel features of construction, combination and arrangement of parts, and in the improved mode of operation, as will be hereinafter more fully described, illustrated in the accompanying drawing and defined in the appended claims.

In the drawing, wherein like characters of reference denote corresponding parts in the different views:

Figure 1 is a perspective view showing, by full lines, the present proof press disposed vertically on a table or other support to which the body of the press may be hinged and with the lid thereof open, and, by dotted lines, the press disposed in a horizontal position with the lid thereof closed.

Figure 2 is a longitudinal section through the press showing the lid thereof closed and the printing form disposed in normal position spaced from the sheet on which the impression is to be made; and

Figure 3 is a view similar to Figure 2 showing the printing form moved against the sheet.

Referring to the practical embodiment of the invention illustrated in the drawing, it will be observed that the present proof press comprises, essentially, a boxlike structure designated generally as A, and that this structure is inclusive of a body portion, designated generally as 10, and a lid designated generally as 11.

The structure A, which may be formed from any suitable material into any desired size and shape, is illustrated in the present instance as of rectangular shape, the body portion 10 thereof being open at its top and comprising a bottom wall 12, side walls 13, 13 and end walls 14, 14, and the lid 11 thereof being open at its inner side and comprising a top wall 15, side walls 16, 16 and end walls 17, 17.

Preferably, but not necessarily, the body portion 10 is hinged along one of the side or end edges of its bottom wall 12, as at 18, to a table top or equivalent support, designated as 19, whereby the press may readily be swung between the vertical and horizontal positions thereof illustrated in Figure 1 for convenience in manipulating the press. Preferably, too, the lid 11 is hinged as at 20, along one of its side or end walls to the related side or end wall, as the case may be, of the body 10, for facility and convenience in opening and closing the lid, but the lid may be entirely separate from the body and in that event any suitable means may be provided for removably securing the lid in closing relation to the open top of the body. In the present instance, devices 21 and 22 are carried by the body 10 and the lid 11, respectively, for cooperation with one another and with the hinges 20 for securing the lid in closed position, and in this connection it will be noted that means is provided to effect an air tight seal between the body and the lid when the latter is closed, said means consisting, for example, of a gasket 23 of rubber or the like disposed on the upper edges of the side and end walls of the body 10 to be engaged by the free edge of the side and end walls of the lid 11.

A rigid perforated support 24 of any suitable type is secured within the body portion 10 at a suitable point above the bottom wall 12 thereof, and on this support is disposed an elastic diaphragm or blanket 25 of sheet rubber or the like the edges of which are secured in air tight relation to the side and end walls of said body portion in any suitable manner. As illustrated in the present instance, a rib 26 of any suitable material is secured to the side and end walls of the body portion 10, and the upper marginal portion of the diaphragm or blanket 25 is cemented against the lower edge of this rib,

as indicated at 27, whereby the seal mentioned is effected.

Preferably, but not necessarily, a yieldable pad 28 of rubber or the like is secured against the inner face of the top wall 15 of the lid 11, and against this pad, or against the inner face of the top wall of the lid, if the pad 28 is not used, is disposed a tympan 29 which may consist of a sheet of relatively soft and, if desired, porous rubber, or felt, or other suitable material.

Carried by the lid 29 are devices 30 of any suitable type for the purpose of holding in a desired position against said tympan the sheet of paper or the like, designated as 31, on which the printing is adapted to be effected.

At 32 is designated a frame within which the printing form, designated as 33, is adapted to be secured in any suitable manner, as, for example, by the use of furniture 34 and ordinary clamping devices in the usual well known manner. This frame 32, with the printing form 33 therein, is adapted to be placed upon the diaphragm or blanket 25 for movement with the latter to and from a printing position against the sheet 31 carried by the tympan 29, and in order to guide the frame and the printing form in their movement, the frame is formed of a size to neatly yet slidably fit within the rib 26, or to neatly and slidably fit the side and end walls of the body portion 10 in the event the rib 26 is not used as a means of sealing the diaphragm or blanket 25.

Extending through the top wall or through the side or end walls of the lid 11 is one or more tubes 35 or the like adapted for connection with any suitable source of suction whereby a vacuum may be produced between the lid 11 and the diaphragm 25 when the lid is disposed in air tight closing relation to the body portion 10, while extending through one or more of the side or end walls of the body portion 10 and communicating with the space between the bottom of said body portion and the diaphragm or blanket 25, is a tube or tubes 36 or the like which is or are adapted for connection with any suitable source of compressed air.

In view of the foregoing the operation of the present proof press is apparent and as follows: Assuming that a sheet 31 is carried by the tympan 29 and that a frame 32 with a printing form 33 therein is disposed on the diaphragm or blanket 25, and that the lid 11 is closed and secured in air tight closing relation to the body portion 10, it is manifest that by exhausting air from the space between the lid 11 and the diaphragm 25, the latter will be flexed toward the lid with the result that contact of the previously inked printing form 33 with the sheet 31 will be effected as shown in Figure 3, with consequent printing of the sheet. On the other hand, it is manifest that the same result will follow if air under pressure is admitted to the space between the diaphragm and the bottom of the body portion 10.

When the frame 32 and the printing form 33 are of relatively light weight, the production of a vacuum between the lid and the diaphragm alone may suffice to produce the necessary flexing of the diaphragm to effect printing. If, however, the frame and the printing form are relatively heavy, compressed air may be admitted between the diaphragm and the bottom of the body portion to augment the effect of the vacuum produced above the diaphragm, or compressed air alone may be employed to produce printing flexure of the diaphragm.

If and when the press is used for color printing, any suitable means may be employed to assure registration of the different impressions in different colors.

As a result of a combination and arrangement of elements as illustrated in the drawing and as described herein, it is manifest that due to the printing form being supported on a yieldable diaphragm, and to the yieldable nature of the tympan, the printing form will be brought to bear with uniform pressure against the sheet whereby a correct impression is assured, and because of this, it is further manifest that by means of the present press, proofs or impressions may be produced expeditiously, and at relatively low cost. Obviously, the arrangement of the printing form and the tympan may readily be reversed; i. e., the printing form may be mounted on the lid and the tympan on the diaphragm.

From the foregoing description considered in connection with the accompanying drawing, it is believed that the construction, operation and advantages of the invention will be fully understood. And while one practical embodiment of the press has been illustrated and described herein, it will be further understood that the same is readily capable of embodiment in various other mechanical structures within the spirit and scope of the invention as defined in the appended claims, as, for instance, in a construction of the said proof press adapted to proofing from metal printing forms as used on cylinder presses.

I claim:

1. A proof press comprising a receptacle inclusive of a body portion and a lid, a diaphragm within said body portion on which a printing form is adapted to be supported, a tympan within the lid, means whereby air is adapted to be exhausted from the space between the diaphragm and the lid to effect flexure of the diaphragm and consequent movement of the printing form into contact with a sheet to be printed interposed between the printing form and the tympan

and means for the supply of compressed air between the diaphragm and the bottom of the body portion.

2. A proof press comprising a diaphragm element and a cooperating support element, a tympan mounted on one of said elements and a printing form being adapted to be mounted on the other of said elements, and means for subjecting the diaphragm to the action of both compressed air and sub-atmospheric pressure to effect flexure thereof with consequent relative movement of the printing form and the tympan toward one another thereby to effect printing of a sheet interposed between the printing form and the tympan.

3. A proof press comprising a receptacle inclusive of an open top body portion and a lid, a perforated support within the body portion spaced from the bottom thereof, a flexible printing form carrying diaphragm disposed on said support and secured in air tight relation at its margin to the side and end walls of the body portion, a tympan carried by the lid, means for effecting an air tight joint between the body portion and the lid when the latter is closed, means for the exhaust of air from the space between the diaphragm and the lid, and means for the supply of compressed air to the space between the diaphragm and the bottom of the body portion.

4. A proof press comprising a receptacle, a diaphragm mounted within said receptacle below the top and above the bottom thereof, a printing form and a sheet to be printed and means for mounting one of the same on the diaphragm and the other within the receptacle, means for the exhaust of air from the container at one side of the diaphragm to effect flexing of the diaphragm to cause the printing form and the sheet to engage each other to produce an impression of the form on the sheet, and means for the supply of compressed air to the container at the other side of the diaphragm to assist said first mentioned means in effecting flexure of the diaphragm.

In testimony whereof I affix my signature.

WILLIAM HEINECKE.