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MEANS FOR ATTACHING PRINTING PLATES TO PRESSES

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Fig. 1

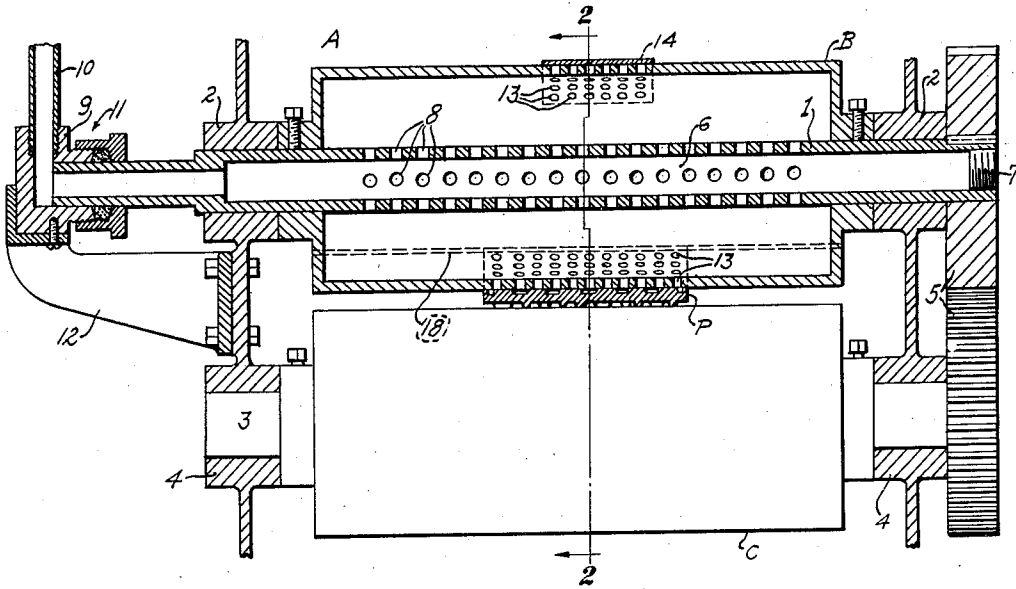


Fig. 2

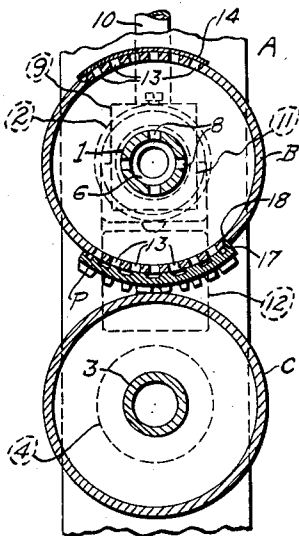
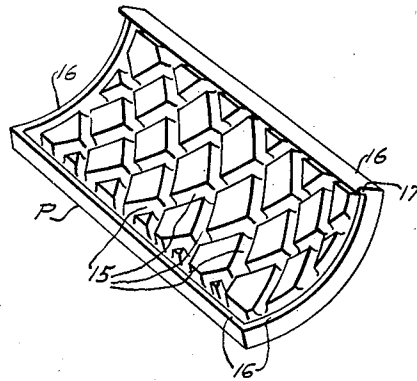


Fig. 3



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MEANS FOR ATTACHING PRINTING
PLATES TO PRESSES

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6 Claims. (Cl. 101—378)

This invention relates generally to means for attaching printing plates to printing presses, and more specifically to improved means which involve the use of suction or vacuum for securing printing plates in place, the predominant object of the invention being to provide improved means for attaching printing plates to cylinders and beds of printing presses in an efficient and greatly simplified manner.

Fig. 1 is a fragmentary vertical section of a printing press arranged in accordance with this invention.

Fig. 2 is a section on line 2—2 of Fig. 1.

Fig. 3 is a perspective of a printing plate used in carrying out my invention.

In the drawing, wherein is shown for the purpose of illustration, merely, one embodiment of the invention, A designates a printing press generally. The particular type of printing press illustrated includes a pair of cylinders B and C between which the material that is to receive the printed impressions passes. The cylinder B is adapted to receive and support printing plates, and in accordance with this invention the plates are attached to the cylinder B with the aid of suction or vacuum. In carrying out the invention, the printing press A is provided with a shaft 1 which is rotatably supported in suitable bearings 2 forming parts of the press structure, the cylinder B, which is of hollow construction, being fixedly attached to the shaft 1 so that it will rotate therewith. The cylinder C is likewise fixedly mounted on a shaft 3, which is supported for rotation in suitable bearings 4 forming a part of the press structure. The shafts 1 and 3 are provided with co-operating gear wheels 5 which serve to transmit rotary motion from one to the other thereof.

The shaft 1 is of hollow construction throughout, as shown in Figs. 1 and 2, so as to provide a chamber or passageway 6 within same, and this chamber or passageway is closed at one end by a suitable plug 7. Also, the portion of the shaft 1 which is located within the hollow interior of the cylinder B is perforated as indicated at 8 in Figs. 1 and 2 for a purpose to be hereinafter set forth. At an end of the shaft 1 opposite to the end thereof at which the plug 7 is located a substantially L-shaped connection 9 is provided. The end portion of the hollow shaft 1 is extended into one leg of this connection and a pipe or other type of conductor 10 is screwed into the other leg of the connection, or is otherwise attached thereto. In view of this arrangement, the opening through the conductor 10 and the pas-

sageway through the shaft 1 are arranged in direct communication with each other. A suitable stuffing box 11 is employed to provide a fluid-tight joint between the L-shaped connection 9 and the portion of the shaft 1 which extends into said connection, this stuffing box being necessary because of the fact that the shaft rotates with relation to the L-shaped connection. The L-shaped connection is supported in a fixed position by a bracket 12 which is secured to and extends outwardly from a stationary part of the press A. The conductor 10 leads from a suitable suction or vacuum creating apparatus, which is not shown on the drawing, to the L-shaped conductor 9.

The curved wall of the cylinder B is provided with groups of apertures 13 which extend through said wall, and arranged in contact with the circumferential face of the cylinder B at one of said groups of apertures is a printing plate P. The cylinder wall is provided with a plurality of groups of apertures so that a plurality of printing plates may be attached to the face of the cylinder at one time. However, for the sake of simplicity of explanation of the invention herein, only one printing plate P is illustrated in the drawing, and when a printing press is employed with only one printing plate P attached to the cylinder B thereof the other groups of apertures 13 are covered by adhesive tape, gummed paper, or such material as indicated at the point designated by the reference character 14.

Each of the printing plates P used in carrying out the invention, at its under or inner face which is disposed adjacent to the circumferential face of the cylinder B, is provided with a plurality of grooves 15 which are arranged in communication with each other. The arrangement of the grooves as illustrated is only suggestive as to how these grooves may be disposed, it being perfectly obvious that the communicating grooves may be arranged in various other formations. Also, if desired, in lieu of the grooves, each printing plate may be provided with one or more cavities at its inner face which extend to points removed inwardly a slight distance from the marginal edge of the printing plate. The purpose of the grooves 15 or the cavities referred to is to assure distribution of suction or vacuum throughout substantially the entire area of the printing plate at the point where the printing plate contacts with the cylinder B.

The printing plate P shown in the drawing is provided with a continuous marginal flange 16 which contacts with the cylinder B throughout

the marginal flange of the plate, and at one side of the plate the marginal flange is provided with an extension 17 that extends downwardly a slight distance below the marginal flange of the printing plate, as shown clearly in Fig. 3. The cylinder B of the printing press A is provided with grooves 18, one of which is located adjacent to each group of apertures, and the extensions 17 of the printing plate P are located in said grooves 18 for the purpose of positioning the printing plates properly with respect to the cylinder and relative to the groups of apertures 13. These grooves 17 may extend longitudinally of the cylinder from end to end thereof, as suggested by dotted lines in Fig. 1, or said grooves may be shorter than the length of the cylinder. By providing the cylinder B with the grooves 18, guides are provided which assist the operator of the printing press in locating the printing plate properly on said cylinder B. If desired, each printing plate may be provided with a plurality of extensions and the cylinder B of the printing press may at each group of apertures be provided with a plurality of grooves to receive said extensions. Also, the extensions may be on the cylinders and the grooves in the plates.

In the use of this invention the printing plate or printing plates to be attached to the cylinder B of a printing press are located in place on the cylinder, and the valve, or other element (not shown) which controls creation of suction or vacuum at the inner faces of the printing plates P is operated. This results in production of suction or vacuum throughout the opening through the pipe 10, the passageway or chamber 6 formed in the shaft 1, the hollow interior of the cylinder B, and, of course, in the apertures 8 and 13 formed in the shaft 1 and through the wall of the cylinder B. This suction or vacuum is felt with equal force at the point where the printing plate or printing plates P contact with the circumferential face of the cylinder B, at which point the suction or vacuum is distributed throughout the inner face or faces of the printing plate or printing plates by the grooves or cavities formed therein. The result of this is that the printing plate or printing plates are securely attached to the cylinder B as long as the suction or vacuum is maintained. When it is desired to remove the printing plate or printing plates from the cylinder, it is necessary merely that the suction or vacuum be discontinued, when the plate or plates may be removed from the cylinder.

While printing plates employed in carrying out the invention may be made of various materials, we find that plates made of rubber or combinations of materials which include rubber answer very well to the requirements of the invention. Also while the drawing illustrates a cylinder type printing press, the invention may be used in connection with printing presses of the flat bed and other types.

Instead of forming the grooves 15 in the printing plate as described above, said grooves may be formed in the face of the cylinder or other part of the press to which the printing plate is attached. Also, in carrying out the invention a slow drying adhesive may be employed to secure the printing plates to the press parts with which they are associated, and the vacuum or suction employed to hold the printing plates in place on the press parts only while the adhesive is drying, the vacuum or suction being cut off after the adhesive has dried. In this way press time which,

in the absence of the use of suction or vacuum would be lost while the adhesive was drying, is saved, as the vacuum or suction will hold the printing plates in their proper places so that the press may be used while the adhesive is drying.

We claim:

1. A printing press including a part adapted to receive and support a printing plate, said press part being provided with a vacuum chamber and having an aperture which communicates with said vacuum chamber and is exposed at a face of said press part, a printing plate arranged at said face of said press part so that a face of said printing plate is exposed to said aperture, and means for creating a vacuum within said vacuum chamber and in said aperture, said printing plate being provided at the point where the printing plate contacts with the press part with means for distributing vacuum throughout substantially the entire area of the inner face of the printing plate.

2. A printing press including a part adapted to receive and support a printing plate, said press part being provided with a vacuum chamber and having an aperture which communicates with said vacuum chamber and is exposed at a face of said press part, a printing plate arranged at said face of said press part so that a face of said printing plate is exposed to said aperture, and means for creating a vacuum within said vacuum chamber and in said aperture, said printing plate being provided at the point where the printing plate contacts with the press part with cavity means for distributing vacuum throughout substantially the entire area of the inner face of the printing plate.

3. A printing press including a part adapted to receive and support a printing plate, said press part being provided with a vacuum chamber and having an aperture which communicates with said vacuum chamber and is exposed at a face of said press part, a printing plate arranged at said face of said press part so that a face of said printing plate is exposed to said aperture, and means for creating a vacuum within said vacuum chamber and in said aperture, said printing plate being provided at the point where the printing plate contacts with the press part with means for distributing vacuum throughout substantially the entire area of the inner face of the printing plate, said means comprising grooves formed at the inner face of said printing plate.

4. A printing press including a part adapted to receive and support a printing plate, said press part being provided with a vacuum chamber and having an aperture which communicates with said vacuum chamber and is exposed at a face of said press part, a printing plate arranged at said face of said press part so that a face of said printing plate is exposed to said aperture, and means for creating a vacuum within said vacuum chamber and in said aperture, said printing plate being provided at the point where the printing plate contacts with the press part with means for distributing vacuum throughout substantially the entire area of the inner face of the printing plate, said means comprising communicating grooves formed at the inner face of said printing plate.

5. A printing press including a part adapted to receive and support a printing plate, said press part being provided with a vacuum chamber and having an aperture which communicates with said vacuum chamber and is exposed at a face of said press part, a printing plate arranged at said face of said press part so that a face of said

printing plate is exposed to said aperture, means
for creating a vacuum within said vacuum cham-
ber and in said aperture, said printing plate be-
ing provided at the point where the printing
5 plate contacts with the press part with means
for distributing vacuum throughout substantially
the entire area of the inner face of the printing
plate, said press part being provided with a de-
pression, and an extension on said printing plate
10 adapted to be arranged in said depression so as
to aid in the positioning of the printing plate
on said press part.

6. A printing press including a part adapted
to receive and support a printing plate, said press
15 part being provided with a vacuum chamber and
having a group of apertures which communicate
with said vacuum chamber and are exposed at a

face of said press part, a printing plate arranged
at said face of said press part so that a face of
said printing plate is exposed to said apertures,
means for creating a vacuum within said vacuum
chamber and in said apertures, said printing 5
plate being provided at the point where the print-
ing plate contacts with the press part with means
for distributing vacuum throughout substantially
the entire area of the inner face of the printing
10 plate, said press part being provided with a de-
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