May 4, 1943. R. G. CHOLLAR 2,318,465

PRINTING MEANS

Filed June 21, 1940

FIG. 1

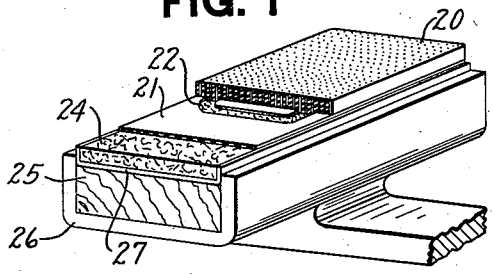


FIG. 2

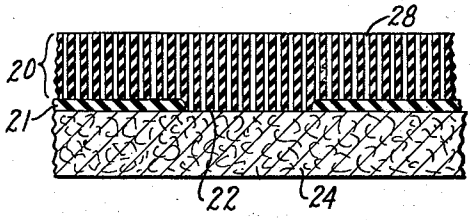


FIG. 3

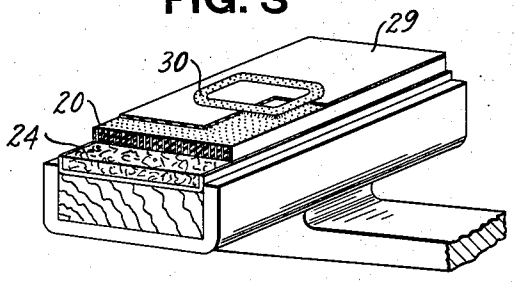


FIG. 4

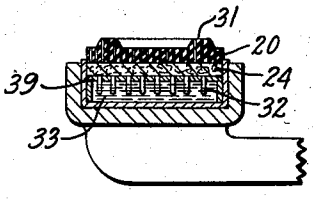


FIG. 5

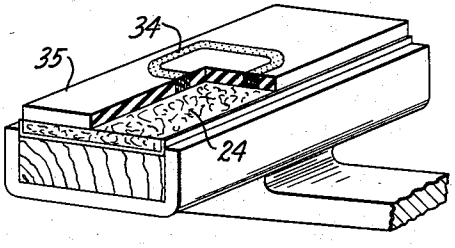


FIG. 6

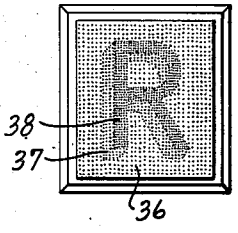


FIG. 7

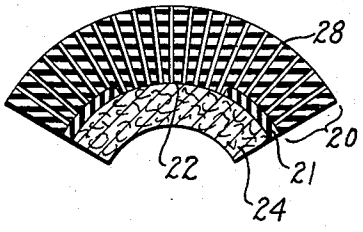
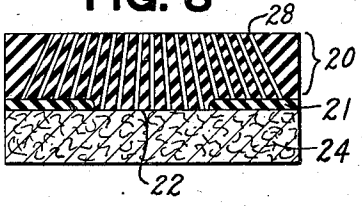


FIG. 8



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UNITED STATES PATENT OFFICE

2,318,465

PRINTING MEANS

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Application June 21, 1940, Serial No. 341,731

20 Claims. (Cl. 101—114)

This invention relates to printing members and more particularly relates to resilient porous printing members having the type face inked from an ink source contacting a non-printing surface of the type member.

The principal object of the invention is to provide a resilient printing member whose printing face is inked by transmission of ink through discrete pores or channels piercing the member.

Another object of the invention is to provide such a porous resilient printing member with means to prevent the transmission of ink through said member except in selected areas.

Another object of the invention is to provide such a porous printing member having the pores so arranged by number and size on the printing surface that, when ink is supplied to the pores from a non-printing surface, half-tone impressions can be made.

Another object of the invention is to provide a resilient printing member part of whose printing surface is ink-resisting and part of whose printing surface is porous to ink.

Another object of the invention is to provide a resilient porous printing member contacted by an ink source on a non-printing surface for the internal transmission of ink through the pores to selected areas of the printing surface.

Another object of the invention is to provide a resilient printing web provided with capillary channels arranged in a parallel system.

Another object of the invention is to provide a resilient printing member pierced with non-communicating capillary pores whose openings at one end terminate on the printing surface and at the other end terminate at an ink source.

Another object of the invention is to provide a selective ink transmission control means between an ink source and a porous printing member.

With these and incidental objects in view, the invention includes certain novel features of construction and combinations of parts, the essential elements of which are set forth in appended claims and a preferred form or embodiment of which is hereinafter described with reference to the drawing which accompanies and forms a part of this specification.

In said drawing:

Fig. 1 represents a resilient printing member pierced by discrete pores, an inking pad, and a stencil sealed between the member and the pad.

Fig. 2 represents a diagrammatic section through the printing member, pad, and stencil shown in Fig. 1.

Fig. 3 represents a resilient printing member having discrete pores backed by an inking pad and opening on the printing surface except where ink is not wanted.

Fig. 4 represents a resilient porous printing member having the type face in relief and having the inking pad inked from a font.

Fig. 5 represents a resilient printing member having porous resilient material inlaid as a character in a non-porous stencil and backed by an ink pad.

Fig. 6 represents a resilient porous printing member having the pores arranged to give half-tone effects.

Figs. 7 and 8 show optional arrangements of the ink channel system of the printing member shown in Fig. 2.

General description

The printing member shown in Fig. 1, comprising a resilient porous impression web or layer **20**, an ink-resisting stencil **21** having the selected symbod **22** cut therein, and an ink pad **24**, is mounted in a conventional printing hammer comprising an ink-proof ink pad holder **27** secured to a mounting block **25** which, in turn, is held in the jaws **26** of a printing hammer lever. Any other method of mounting the printing member, such as in a hand stamp, on a cylinder press, or a squeeze printer, may be used in place of the lever without departing from the principle of the invention.

The porous resilient impression web **20** (Figs. 1 and 2) has a multitude of discrete capillary pores extending from the one side of the web to the other side of the web, each pore being located in the same relative position to its neighboring pores throughout their length. As shown in section in Fig. 2, the pores may be parallel and at right angles to the surfaces of the web, or they may be arranged ray-like or divergent if it is desired, the pattern of the orifices on one side of the web having a larger area than on the other side (Figs. 7 and 8). The impression web **20** is preferably made of resilient rubber or resilient rubber-like material, wettably by ink, having the capillary pores spaced approximately one one-hundredth of an inch apart in each direction, each of the pores themselves being about one two-hundredth of an inch in diameter. The capillary pores or channels may be varied in diameter and spacing to suit the printing requirements.

The stencil **21** (Fig. 1) may be cemented or otherwise fastened by ink-resisting means between the porous web **20** and the ink-saturated pad **24**. As an impression is made, those capil-

lary pores 28 (Fig. 2) having been previously in contact with the ink pad and consequently filled with ink by capillary action, on being squeezed by the pressure against the resilient web 20, emit the ink which they contain, which ink is transferred to the printed surface. The closeness of the pores of the suggested dimensions, even though discrete particles of ink are expressed onto the printing surface, produces to the eye a continuous effect. Only those capillaries 28 which are in contact with the ink pad 24 through the openings in the stencil contain ink, and therefore the inked impression will be of the pattern represented by the stencil openings. Thus the ink is, by a pumping action, profusely supplied to the printed surface in controlled areas. The release of the compression of the resilient layer 20, after the printing impression, serves to supplement the capillary absorption of ink from the pad by a pumping action upon the ink pad. By changing the stencil a different portion of the web may be utilized. It is to be observed that, in addition to the pumping action in absorbing and delivering ink, the porous web by its resilience allows printing on an uneven surface. Because of the small area of the exposed ink-bearing pores, the drying influence of the air upon the ink is minimized.

Fig. 3 shows a stencil 29 of ink-resisting material, an ink pad 24, and a resilient capillary porous web 20 sandwiched between. The resilient web 20, on compression, forces the ink through the opening in the stencil, on contact with the printing surface.

Fig. 4 represents the use of a resilient capillary porous web 20 having the printing face character cut in relief 31, so that only that part of the web in relief will contact the printing surface. The characters to be printed may also be cut in intaglio, so that the background of the symbol contacts the printed material. The web 20 directly contacts an ink pad 24. Applicable to all the ink pads shown is the provision of a font 33 of ink, into which wicks 32 of the pads are inserted through a screen supporting plate 39.

Fig. 5 shows an ink pad 24 and a non-porous resilient wab 35 having inlaid in a cut-out portion thereof the resilient capillary porous substance 34, so that, upon an impression, ink will come only through the porous inlay.

Fig. 6 shows the resilient porous substance, as the web previously mentioned, having the pores distributed in size or spacing so as to produce half-tone effects, such as shown at 36, 37, and 38, as is commonly the practice in printing by dots, spaced and sized to produce shading.

In the forms of the invention shown in Figs. 1 and 3, either of the surfaces of the web may be vulcanized or otherwise have the pores sealed, such as by an ink resist, in selected areas so that a separate stencil may be dispensed with.

The resilience of the porous web, the arrangement of the pores in a parallel or other symmetrical non-interconnecting system, and the passage of ink therethrough from the ink pad to the printing surface both by capillary action and by pumping action constitute a combination of elements which are common to all the porous webs shown in the drawing.

While the forms of the invention herein shown and described are admirably adapted to fulfill the objects primarily stated, it is to be understood that it is not intended to confine the invention to the forms or embodiments herein disclosed, for it is susceptible of embodiment in various forms all coming within the scope of the claims which follow.

What is claimed is:

1. In a printing member, in combination, an ink pad; and a resilient printing web having discrete capillary pores, one end of each pore being in contact with the ink pad and the other end of each pore terminating on the printing face of the web.

2. In a printing member, in combination, an ink pad; and a printing web of resilient material having parallel non-interconnecting capillary pores piercing it, said web being in contact with the ink pad on one of its porous sides and the other porous side being the printing face.

3. In a printing member, in combination, an ink pad; and a printing web of resilient porous material shaped to represent the symbol to be printed, the pores in said material being spaced equi-distant and being non-interconnecting.

4. In a printing member, in combination, an ink pad; a printing web of resilient material having equi-spaced pores; and a resist sealed between the pad and the web preventing passage of ink from the pad to the porous material except through selected areas.

5. A printing member consisting of an ink pad; a printing web of ink-saturated resilient porous material in contact with the ink pad; and a stencil sealed between the ink pad and the said resilient web of porous material.

6. In a printing member, in combination, an ink pad; a printing web of a resilient material having parallel capillary pores piercing it; and an ink-resisting substance sealed between selected areas of the pad and one of the porous sides of the web.

7. In a printing member, in combination, an ink pad; a printing web of resilient material having parallel capillary pores piercing it; and a stencil sealed between the ink pad and the said resilient web of porous material.

8. A unitary printing member consisting of an ink pad; an ink-conducting web having a front printing surface attached to the ink pad; and a stencil sealed between the pad and the back of the web.

9. In a printing member, in combination, an ink source; a resilient printing medium having a printing surface and an ink source contact surface and having ink-conducting channels of capillary size supplied in the printing medium in profuse numbers in non-interconnecting arrangement between the printing surface and the ink source contact surface; and means to control which of the channels shall conduct ink from the ink source to the printing surface.

10. In combination, a resilient web of rubber having capillary channels therein from the top surface to the bottom surface, said channels being profuse in number and arranged in parallel; and means to supply ink to one of said capillary surfaces to be conducted to the other surface through said capillary channels when the resilient web is compressed.

11. The combination of resilient type having profusely supplied therein capillary pores parallel to one another throughout their length, one end of the pores terminating on the printing face and the other end of the pores terminating on the rear surface; and an ink source in contact with the rear surface of said type.

12. A printing member pierced by capillary

channels arranged in pattern and diverging ray-like from one side of said member to another side of said member.

13. A printing member pierced by capillary channels arranged in pattern and diverging ray-like from the printing face toward another surface of said member.

14. A printing member pierced by capillary channels arranged in pattern and diverging ray-like from a non-printing surface of the member to a printing surface of the member.

15. A resilient printing member pierced by capillary channels arranged in pattern and diverging ray-like from one side of said member to another side of said member.

16. A resilient printing member pierced by capillary channels arranged in pattern and diverging ray-like from the printing face toward another surface of said member.

17. A resilient printing member pierced by capillary channels arranged in pattern and diverging ray-like from a non-printing surface of the member to a printing surface of the member.

18. A resilient printing member having a profuse number of non-communicating ink-transmitting pores opening on the printing face at one end and opening on a stencil-covered ink pad at the other end, the ends of each of said pores being located in the same relation to the ends of the other pores on both terminal faces.

19. In a printing member, in combination, a resilient printing member having parallel ink channels of capillary size piercing said member and opening on the printing face; means to supply ink to the channels where it may be stored and be rendered available at the printing face on compression of the resilient member; and means to determine which channels shall have ink available at the printing face end.

20. A unitary printing member consisting of an ink pad; a resilient ink-conducting printing medium attached to the ink pad; and means sealed intermediate the ink pad and the printing medium preventing the conduction of ink to certain areas of the printing medium.

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