Sept. 20, 1960 C. B. LYON 2,952,862

DIFFERENTIALLY ZONED INKING MEANS

Filed Nov. 23, 1956

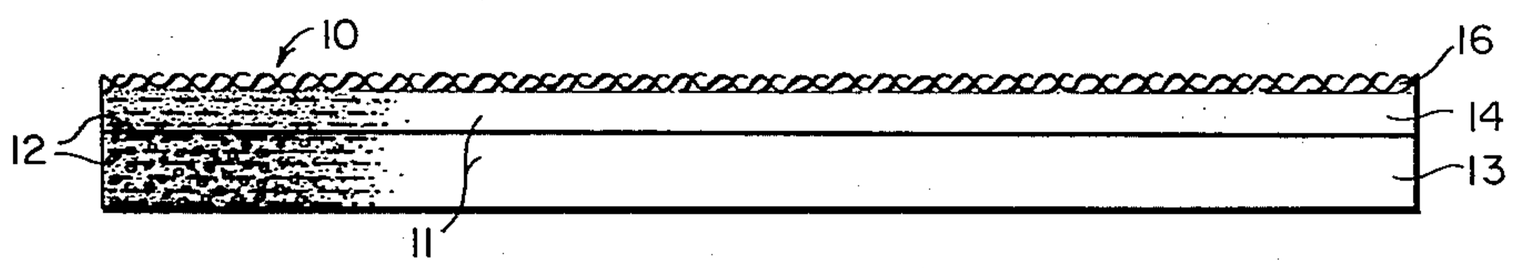

FIG. 1

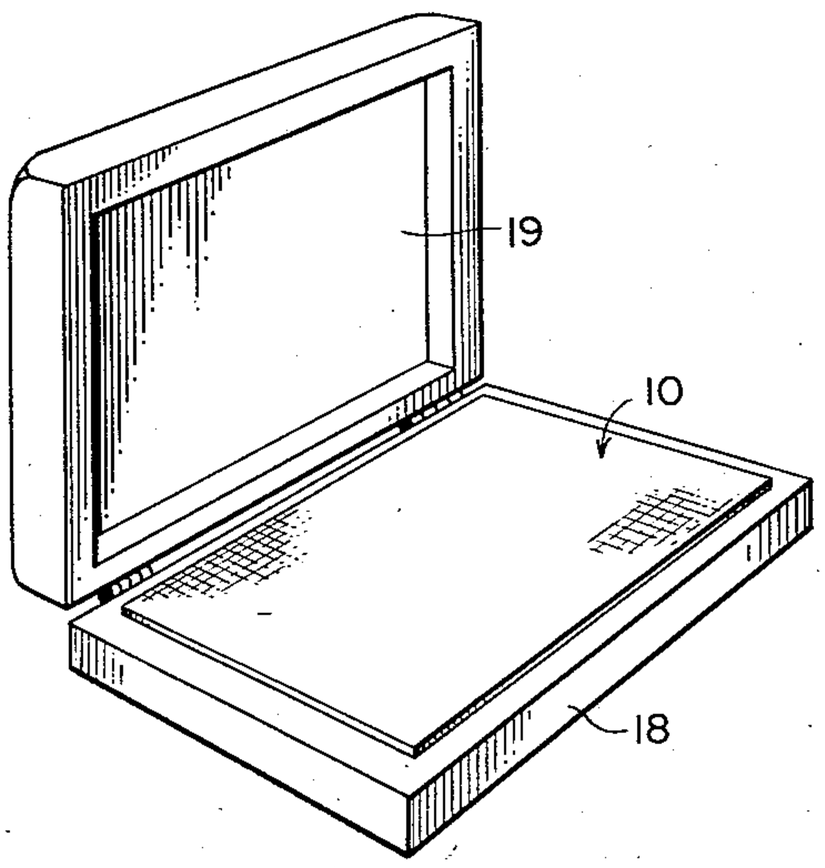

FIG. 2

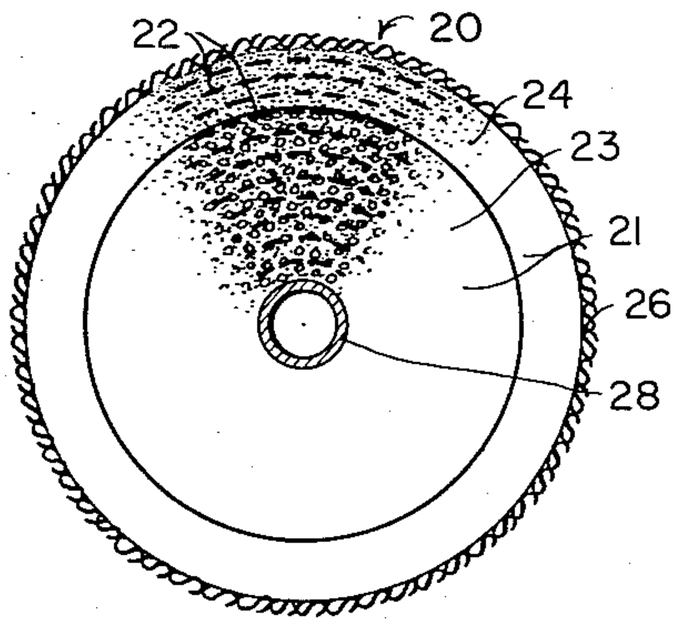

FIG. 3

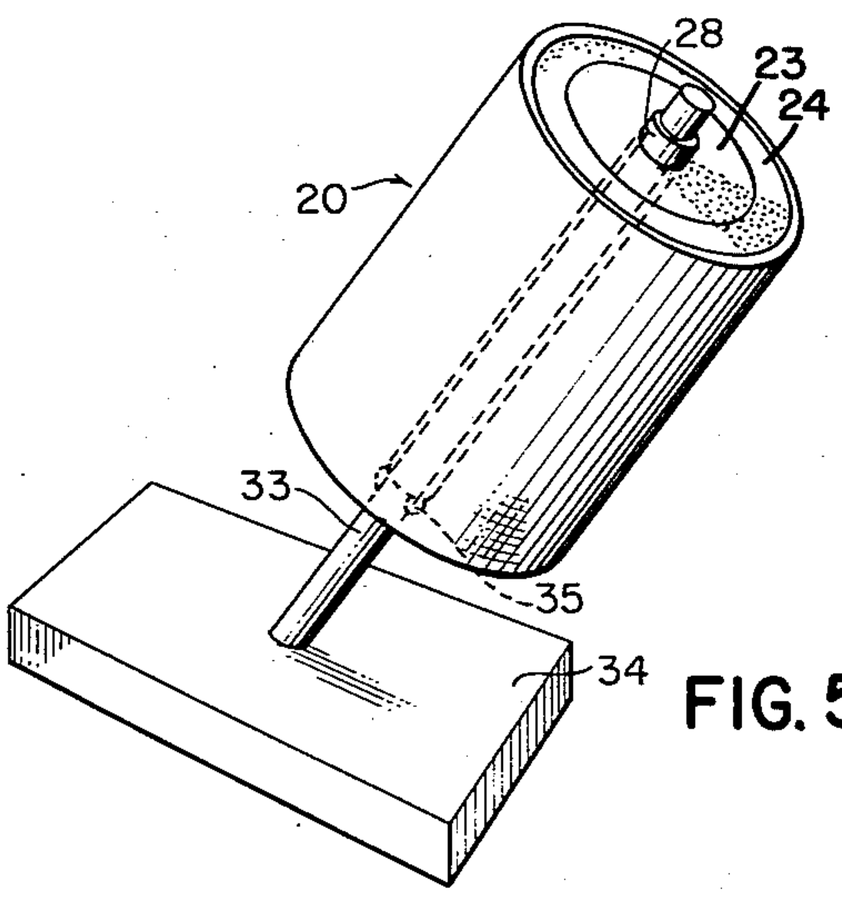

FIG. 5

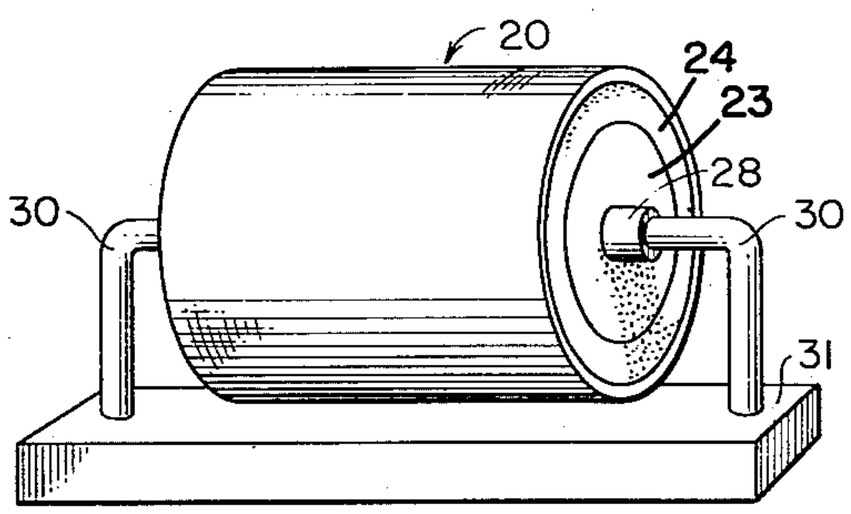

FIG. 4

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DIFFERENTIALLY ZONED INKING MEANS

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This invention relates to inking devices for rubber stamps and the like.

An object of the invention is to provide an ink transfer device where high-capacity ink storage is achieved through the provision of a porous body having gross voids therein to constitute a high-capacity ink reservoir zone.

Another object of the invention is to provide an inking device in which the supply of ink from the reservoir zone to the ink transfer surface of the device is accomplished through a boundary zone of porous material which is free of gross voids, the boundary zone being contiguous to the reservoir zone.

Another object of the invention is to provide an inking device wherein the high-capacity storage and the distribution of the ink is accomplished through contiguous reservoir and boundary zones, the boundary zone being encased in a fabric which serves to improve the ink transfer function of the device.

These and other objects and advantages of the invention will become more fully apparent from a complete reading of the specification and from the drawings in which:

Figure 1 is a schematic elevational view of a device embodying the invention.

Figure 2 is a view illustrating one of the many possible ways in which the device shown in Figure 1 might be mounted.

Figure 3 is a schematic elevational view of another device embodying the invention.

Figures 4 and 5 are views illustrating two of many possible ways in which the device shown in Figure 3 might be mounted.

The pad generally indicated by the reference numeral **10** in Figures 1 and 2 comprises a permeable calcium sulfate slab **11**. The slab is permeated with an ink **12** in such a manner that the ink is distributed throughout the body of the slab. The slab **11** has extremely small ink-absorbing interstices and comprises an inner or lower reservoir zone **13** which includes relatively gross voids and a boundary zone **14** which is free of gross voids. A fabric **16** is preferably provided on the outer surface of the boundary zone **14**.

It is presently preferred that the slab **11** be fabricated by separately forming and filling with ink the reservoir zone **13** and the boundary zone **14** and then subsequently pressing or positioning these two slabs together and causing them to be retained together by frictional contact or by encasing them in a suitable housing or the like.

To make the boundary zone **14**, water is added to dehydrated calcium sulfate (plaster of Paris) and the mix is poured into the mold and allowed to dry for 24 hours to form a large, fine pored, permeable plate. Pore size may be increased or decreased by increasing or decreasing the ratio of water in the mix. The dry plate is cut to size and then individual slabs are suspended in a bath of ink so that the ink may permeate the slab from both sides. A

slab ⅛" thick should require about 48 hours to become totally saturated with ink, the degree of saturation being determinable by weighing. If the required time for total saturation varies widely from 48 hours, departure from standard pore size is indicated. In such case, the water ratio in subsequent mixes is varied until a proper pore size is indicated by an elapsed time for total saturation of approximately 48 hours.

The above directions apply to the making of the boundary zone where the ink viscosity is comparable to the inks given by way of example in U.S. Patent 2,723,476. The values given may, if desired, be approximately varied where higher or lower ink viscosities obtain.

The reservoir zone may be made by adding water to dehydrated calcium sulfate and pouring the mix into a suitable mold, the water in this case containing a suitable blowing agent, such as sodium bicarbonate. The water to dehydrated calcium sulfate ratio may be the same as that in the manufacture of the boundary zone. The ratio of the blowing agent, such as sodium bicarbonate to the dehydrated calcium sulfate is preferably about 1.0% by weight, although this ratio may be varied between a relatively low figure at which there is a significant, but not substantial, blowing effect (approximately .05%) to a figure short of where significant disintegration occurs (approximately 5.0%). The freshly poured mix within the mold is subjected to the action of the blowing agent as it dries to form a permeable plate in which there are included numerous relatively gross voids. The dried plate is cut to size and the individual slabs are suspended in a bath of ink so that the ink may permeate the slabs from both sides.

Alternatively, the mix which forms the reservoir zone may be blown by whipping.

The fully saturated boundary zone slabs and reservoir zone slabs are joined together as mentioned above. Either before, during or after such joining operation the boundary zone **14** may be covered with the fabric **16**. The fabric **16** is preferably a woven fabric of relatively close weave or an unwoven fabric of equivalent characteristics. The fabric should be essentially comprised of a non-monofilamentous yarn, such as cotton, wool, or other natural fiber, or non-monofilamentous forms of the various organic resinous materials which are suitable for use as yarns and which exhibit capillary action to a significant degree when wetted with liquid. In general, I find it preferable to employ a liquid petrolatum base or other mineral oil base aniline dye ink of relatively high velocity. The inks specified in U.S. Patent No. 2,723,476 may be employed if desired, although for the applications to which the present invention is directed it may be preferred to employ inks of somewhat lower velocities and/or viscosities.

Carbon black inks should be avoided because the permeable calcium sulfate slab will precipitate out the carbon, and the liquid withdrawn from the pad will have a weak color unsuitable for the intended purpose of the device.

A suitable case such as that illustrated in Figure 2 may be provided to house the bad **10**. To minimize the possibility of damage to the pad, the base **18** of the case may be constructed to snugly fit the pad and to closely conform to the bottom surface of the pad in order to obtain uniform support. The interior dimensions of the lid **19** may also be as closely dimensioned as practical to the upper portion of the pad, with only a small spacing or no spacing between the lid **19** and the pad **10** in the closed position.

The fabric **16** may be cast in the boundary zone **14** or may be impressed in the material making up such zone before setting thereof, or it may be positioned on

the boundary zone at a later time and suitably anchored thereon.

Shown in Figure 2 is a roll generally indicated by the reference numeral **20**. The roll comprises a cylinder **21** of permeable calcium sulfate which is permeated with an ink **22**. The cylinder **21** includes an inner reservoir zone **23** in which are formed relatively gross voids and an outer boundary zone **24** in which there are substantially no gross voids.

The cylinder **21** may be covered with a fabric **26**. The specifications for such fabric may be the same as those for the fabric **16**. Similarly to the fabric **16**, the fabric **26** may be cast with the boundary zone **24** or may be impressed thereon prior to softening thereof or may be anchored therearound at a later stage.

In the manufacture of the cylinder **21** it is preferred that the reservoir zone **23** and the boundary zone **24** be separately formed and saturated with ink prior to being combined as by sliding the reservoir zone **23** into the initial hollow-shell form of the boundary zone **24**. The reservoir zone **23** and the boundary zone **24** may be cast in suitable cylindrical molds with a suitable core being provided in the case of the boundary zone. A hollow shaft **28** may be molded in the center of the reservoir zone during casting thereof.

In the manufacture of the reservoir zone **23** and the boundary zone **24**, the same specifications may be followed as are disclosed above in connection with the manufacture of the reservoir zone **13** and the boundary zone **14**.

A suitable stand such as that illustrated in Figure 4 may be provided to mount the roll **20**. A pair of spring arms **30** may be fixed to a base **31** and may be releasably received in the ends of the hollow shaft **28**.

Another stand is illustrated in Figure 5. Here the hollow shaft **28** is received on a rod **33** which is fixed to a base **34**. The roll **20** is held in spaced relation from the base by ears **35** formed in the rod **33**. In the several uses of the invention illustrated in Figures 2, 4, and 5 and in other similar uses, the invention provides an inking device in which the supply of ink from the reservoir zone to the ink transfer surface is accomplished through a boundary zone of porous material which is free of gross voids while, at the same time, the device as a whole exhibits a great ink capacity and has an extremely long service life which far exceeds those of present stamp pads.

The invention may be regarded as involving the achievement of a high-capacity inking device through the employment together of a zone of relatively gross voids and a permeable bounding zone which is free of gross voids in order to accomplish even ink distribution and

the further provision of an encasing or facing fabric to provide a resilient inking surface and to draw the ink out exteriorly from the solid porous body which contains and distributes the ink.

From the above description, it will be apparent that many modifications in the disclosed examples of my invention will suggest themselves. The scope of the invention is defined by the following claims.

What is claimed is:

1. An inking device comprising a porous body of permeable calcium sulfate dehydrate, said body having a reservoir zone with a plurality of relatively gross voids formed therein and also having a boundary zone contiguous with said reservoir zone and having only relatively small voids, a mineral oil base ink in said voids and interstitially dispersed throughout said body, both the relatively gross and relatively small voids being of such size that capillary action of the ink within the zones takes place, and a fabric associated with said body and secured to the outer surface of said boundary zone.

2. An inking pad comprising a porous slab of permeable calcium sulfate dehydrate, said slab having a reservoir zone with a plurality of relatively gross voids formed therein and also having a boundary zone contiguous with said reservoir zone and having only relatively small voids, a mineral oil ink in said voids and interstitially dispersed throughout said slab, both the relatively gross and relatively small voids being of such size that capillary action of the ink within the zones takes place, and a fabric associated with said slab and secured to the outer surface of said boundary zone.

3. An inking roll comprising a porous cylinder of permeable calcium sulfate dehydrate, said cylinder having a reservoir zone with a plurality of relatively gross voids formed therein and also having a boundary zone contiguous with said reservoir zone and having only relatively small voids, a mineral oil base ink in said voids and interstitially dispersed throughout said cylinder, both the relatively gross and relatively small voids being of such size that capillary action of the ink within the zones takes place, an axially extending shaft in said cylinder, and a fabric associated with said cylinder and secured to the outer surface of said boundary zone.

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