(No Model.)

H. SCHULZE-BERGE.

APPARATUS FOR PRINTING UPON BULGED ARTICLES.

No. 435,459. Patented Sept. 2, 1890.

Fig. 1.

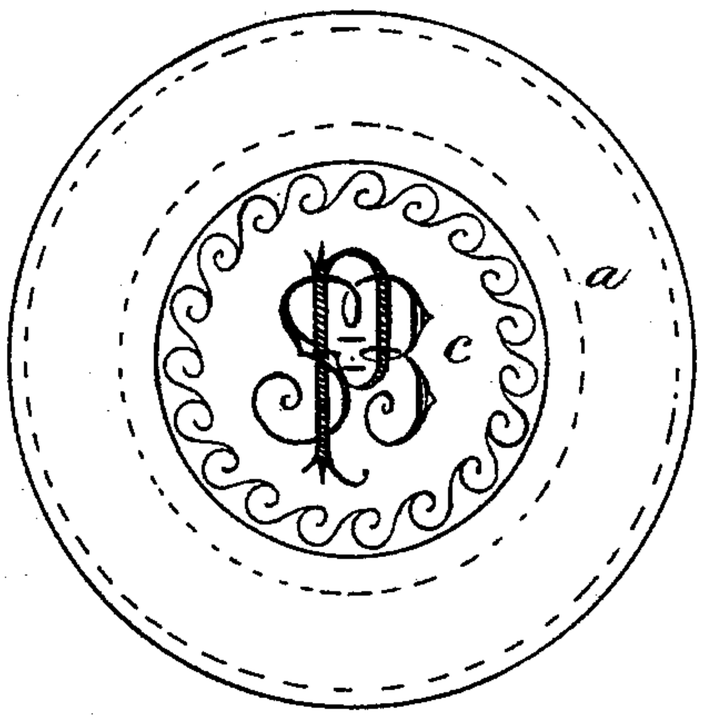
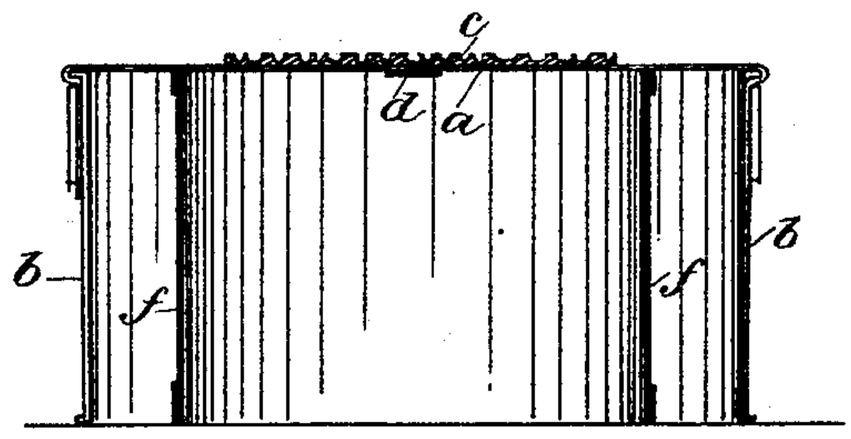


Fig. 2.



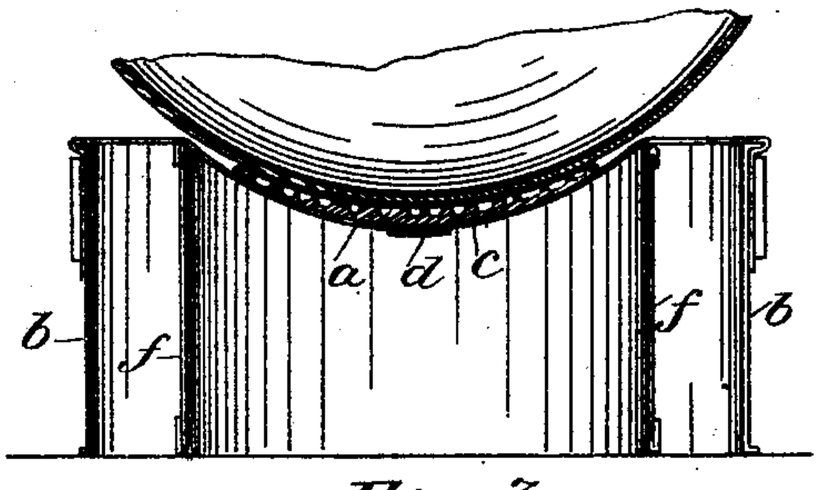


Fig. 3.

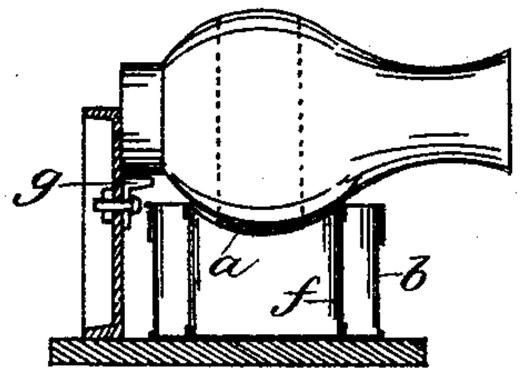


Fig. 4.

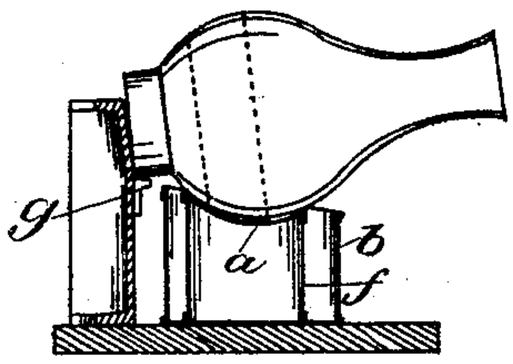


Fig. 5.

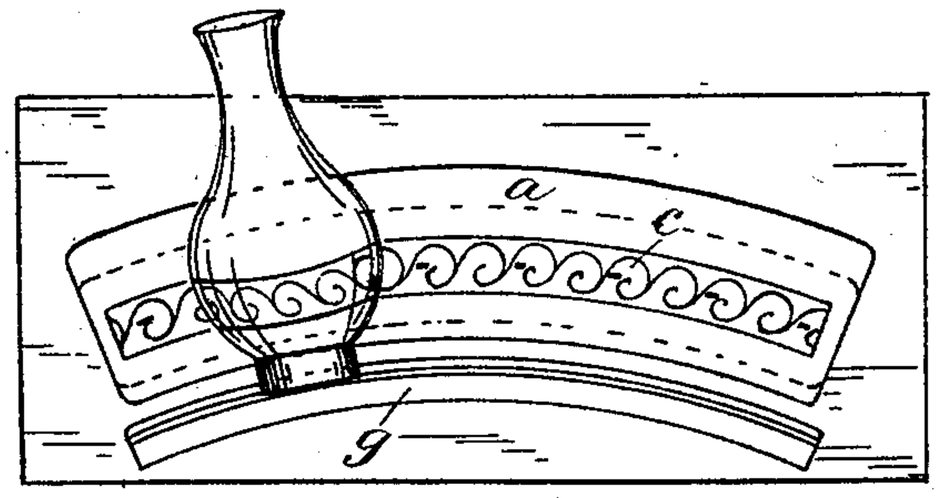


Fig. 6.

WITNESSES:

S. V. King

W. B. Conover

INVENTOR

Hermann Schulze-Berge

BY Wm Bakewell & Sons

ATTORNEYS.

UNITED STATES PATENT OFFICE.

HERMANN SCHULZE-BERGE, OF ROCHESTER, PENNSYLVANIA.

APPARATUS FOR PRINTING UPON BULGED ARTICLES.

SPECIFICATION forming part of Letters Patent No. 435,459, dated September 2, 1890.

Application filed November 18, 1889. Serial No. 330,660. (No model.)

To all whom it may concern:

Be it known that I, HERMANN SCHULZE-BERGE, a citizen of the Empire of Germany, and a resident of Rochester, in the county of Beaver and State of Pennsylvania, have invented a certain new and useful Improvement in Apparatus for Printing upon Bulged Articles, of which the following is a full, clear, and exact specification.

My present invention consists in an apparatus for printing upon bulged or cylindroidal objects—such as lamp-chimneys, globes, electric-light bulbs, and similar bulged objects—which apparatus comprises a flexible and elastic printing-pad provided with raised characters and supported by a swinging membrane of flexible and elastic substance—such as india-rubber—stretched upon a frame.

The apparatus is illustrated in the accompanying drawings, in which—

Figure 1 is a top view of the apparatus. Fig. 2 is a vertical cross-section. Fig. 3 is a vertical cross-section showing the printing-surface of the apparatus depressed by a spherical object. Figs. 4, 5, and 6 represent in vertical section and plan view a similar apparatus in a modified form.

Like symbols of reference indicate like parts in each figure.

In printing with elastic printing-stamps upon bulged objects the drawback arises that some parts of the pattern are stretched more than others and a partly-distorted print results. This is generally the case if the printing-surface itself is caused to participate in the stretching of the printing-pad around the bulged object with sufficient pressure or force to leave a printed impression thereon. This objection results, chiefly, from the elastic printing-surface constituting the printing-pad or being fastened with its entire under side upon the pad, so that the printing-surface must stretch and elongate if the printing-pad be depressed or indented. In my improved printing apparatus as represented in the drawings I overcome such difficulty by using a rather thin and elastic swinging membrane *a*, stretched over a frame *b*, and a separate pliable or elastic printing-surface *c*, placed loosely upon the swinging membrane *a* and attached thereto or held in place thereon by being sewed to it with a few stitches of thread *d*, or otherwise joined thereto near the middle or the middle line of the printing design. In this case the swinging membrane *a* can be stretched or elongated without causing the printing-surface to partake of the elongating, so that if a bulged article is depressed upon the printing-surface *c* it causes the latter only to conform to the shape of the article, while the stretched swinging membrane *a* elongates and slides out from beneath the printing-surface *c*, simultaneously pressing the printing-surface *c* upon the bulged article.

As represented in Figs. 1 to 3, the frame *b*, over which the membrane *a* is stretched, is circular in shape, and is preferably made of tinned sheet-iron or the like, and the membrane *a* is attached thereto in a manner similar to the attachment of a drum-skin to a drum. A second smaller circular frame *f* is placed loosely and centrally inside of the frame *b* and below the membrane *a*, for the purpose of getting the effect of a larger piece of the elastic membrane concentrated and to act upon a comparatively smaller area over which the printing-surface *c* is located, thereby producing a more yielding pressure upon the printing-surface than otherwise attainable. This will be understood by reference to Fig. 3, where a globular object is depressed upon the printing-surface.

Figs. 4, 5, and 6 represent the apparatus suitably constructed for the purpose of printing designs upon cylindroidal objects—such as lamp-chimneys—which can be depressed with their bulged portions upon the apparatus, and then be rolled over it in a manner similar to the operation of the apparatus described in Letters Patent No. 296,223, issued to me April 1, 1884.

In the figures, *b* represents the oblong or rectangular frame of tinned sheet-iron or the like over which the swinging membrane *a* is stretched, and to which membrane the printing design *e* is attached by being sewed thereto by the stitches *d* near the middle line of the design. The stitches by which the printing design or pad is attached are not shown in these figures.

f represents the inside frame, ledges, or ribs which concentrate the elasticity of the swinging membrane upon the printing-surface *c* when an object is depressed upon the

printing design. The inside frame *f* or its upper edge may itself serve as bearing-surfaces for the object to be rolled thereon, and another guide or rail *g* is preferably provided for the foot or end of the object to rest against while the object is rolled over the printing-surface.

Instead of depressing the bulged object upon the printing-pad the reverse operation may be performed of depressing the printing-pad, if provided with suitable mechanism, upon the bulged article, which may be done in a manner similar to that described by me in Letters Patent No. 418,236, issued to me on December 31, 1889.

I claim—

1. In apparatus for printing upon bulged or curved articles, the combination of a frame, an elastic membrane, and an elastic printing-pad attached at a part only of its rear to the elastic membrane, whereby the said membrane is capable of independent stretching, substantially as and for the purposes described.

2. In a printing apparatus for printing upon bulged or curved articles, a frame, in combination with a stretched elastic membrane having an elastic printing-surface thereon, and another narrower frame or ribs within the first-named frame, substantially as and for the purposes described.

3. In apparatus for printing upon curved or bulged objects, a flexible membrane provided with a printing-pattern located above a space into which the printing-pattern can be depressed by a bulged object, in combination with a ledge or ledges on which the bulged object may be rolled over the printing-surface, substantially as and for the purposes described.

4. Apparatus for printing upon bulged or curved articles, consisting of a frame provided with a flexible membrane, and a printing surface or pad secured to the membrane at one point or place only, whereby the membrane may be stretched without substantially stretching the printing-surface, substantially as and for the purposes described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 31st day of October, 1889.

HERMANN SCHULZE-BERGE.

Witnesses:

C. W. HURST,

CHAS. RUNYON.