A. B. SPENCER.

FILTER FOR PHARMACEUTISTS AND OTHERS.

No. 65,515. Patented June 4, 1867.

Witnesses;
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United States Patent Office.

A. B. SPENCER, OF ROCHESTER, NEW YORK.

Letters Patent No. 65,515, *dated June* 4, 1867.

IMPROVED FILTER FOR PHARMACEUTISTS AND OTHERS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, A. B. SPENCER, of Rochester, in the county of Monroe, and State of New York, have invented a certain new and useful improvement in Filters; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making a part of this specification.

Figure 1 is a sectional elevation of my improved filter.

Figure 2, a perspective view of the several parts composing the filter proper, the said parts being shown detached and separated for convenience of illustration.

Figure 3, a perspective view of the seat of the tunnel that rests upon the bottle or jar, the same being inverted.

Like letters of reference indicate corresponding parts in all the figures.

My improvement belongs to that class known as atmospheric filters, and is of a portable form, and intended more particularly for the use of chemists, pharmaceutists, photographers, &c., in the rapid filtration of their liquids. The invention consists in adapting the filtering-tunnel to be placed upon an ordinary bottle or jar by a suitable packing, whereby the liquid may be easily transferred; and also in the peculiar arrangement of the filtering-throat, consisting of a removable perforated diaphragm, and disks of filtering media clamped thereon.

As represented in the drawings, A is the filtering-tunnel; B, the bottle or jar on which it rests; C, the air-pump to exhaust the air; and D the flexible hose connecting the tunnel with the pump. These form the main parts of the filter. In practice I find that hard rubber, by being cheap and not easily affected by acids and chemicals. is the best material for the tunnel and air-pump, though, if desired, any substitute may be employed. The tunnel is made in two parts *a b*, the first forming the mouth for receiving the liquid poured in, and the last the tunnel proper or neck that rests in the mouth of the bottle. These parts are connected by screw-threads, and have shoulders *c c*, which clamp the filtering medium between them so as to pack tightly at the edges and prevent any passage of air, except through the centre. For the filtering medium, I prefer disks *d d* of prepared paper, with a similar disk of cloth at the bottom, but any substitute that will answer the same purpose may be employed. These disks rest upon a removable perforated diaphragm, *f*, countersunk in a seat in the tunnel.

The special advantage of this arrangement of securing the filtering medium is that while I am enabled to use prepared paper, I also properly support it against the atmospheric pressure by the employment of the perforated diaphragm beneath, so that the whole is strong and firm, but allows a free passage of the liquid through. At the same time, the diaphragm, by being of less diameter than the edge upon which the paper rests, and by being sunk flush with the surface of said seat, allows the two shoulders *c c* to clamp the paper firmly outside the diaphragm, so as to pack tightly and make an air-tight joint. Thus no air can possibly pass around the joint, but its whole pressure must be exerted on the paper when a vacuum is created beneath. The removal of the diaphragm also facilitates washing and cleaning. When the diaphragm is removed it presents only a plane surface, and the neck of the tunnel over which it rests is also smooth and unbroken. This is of great importance in a filter for acids and chemicals where great cleanliness is necessary. The tunnel is provided with a bearing, *g*, which is made of considerable width, to bear upon the mouths of bottles of different diameters. This bearing is provided with a ring of rubber, *h*, to form a packing between the tunnel and the top of the bottle. When the pump draws upon the air beneath, the pressure above will press the packing-ring closely upon the top of the bottle and make an air-tight joint. A small hole or passage, *k*, is made through the rubber packing opening into a nipple, *i*, inserted in the tunnel. This nipple is connected with the air-pump by the flexible hose D. The air-pump is constructed in any convenient manner to exhaust the air. I prefer, however, to attach the hard rubber body of the pump to an iron base, *l*, which may either be screwed fast to the support or held by a clamp, E, as shown.

Atmospheric filters are in common use. Mine is a small portable filter, and differs from the ordinary kind in having the filter proper composed of the tunnel A, so as to be applied in filling different receptacles by simply changing from one to another; or the liquid may be filtered and transferred without a draw-cock, which is required when the filter and receptacle form one body. In order to make this filter practical and effective, the packing-ring *h* is of the greatest importance. As soon as the suction is applied the ring closes and makes an air-tight joint. Without this packing, or its equivalent, no vacuum could be produced.

I do not claim broadly an atmospheric filter, as I am aware that the same is old; but what I claim as my invention, and desire to secure by Letters Patent, is—

1. In an atmospheric filter composed of the tunnel A, bottle or jar B, and air-pump C, the employment of a packing, *h*, for the purpose of producing an air-tight joint between the tunnel and bottle, the whole combined and operating as herein set forth.

2. The arrangement of the filtering medium *d d* with the removable perforated diaphragm *f*, when operating in connection with the shoulders *e e*, as herein set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

A. B. SPENCER.

Witnesses:

J. A. DAVIS,

CHAS. F. SPENCER.