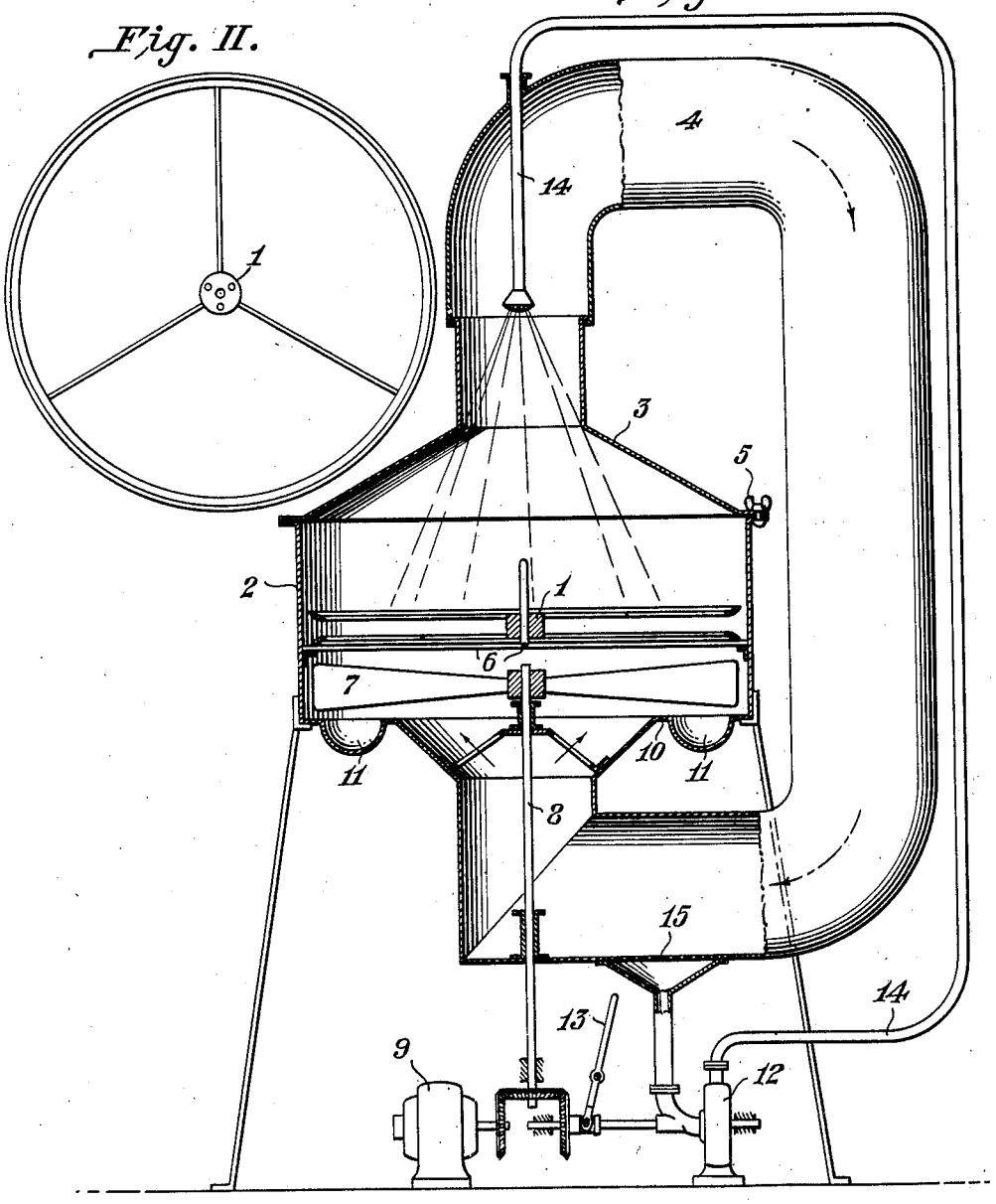
Nov. 8, 1932. M. SCHLÖMER 1,886,596

APPARATUS FOR TREATING FILMS

Filed April 16, 1930

Fig. II.

Fig. I.



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Patented Nov. 8, 1932 1,886,596

UNITED STATES PATENT OFFICE

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APPARATUS FOR TREATING FILMS

Application filed April 16, 1930, Serial No. 444,860, and in Germany April 23, 1929.

The present invention relates to an apparatus suitable for subjecting all parts of a wound film to reagents present in the gaseous or liquid state.

According to my invention all parts of photographic films, especially cinematograph films, while wound, are subjected to well known gaseous or liquid reagents generally used in the maintenance and treatment, that is purification, removal of brittleness and/or hardening of films in a convenient, quick, efficacious and automatic manner by working with an apparatus constructed as hereinafter described.

In the annexed drawing Figure I represents a longitudinal section of the apparatus, and Figure II is a plan view of a drum suitable for the purpose of the invention;

The apparatus consists of a circular container (2). The upper half serves for the reception of the film and fits like a lid on the lower part of the container. To open the apparatus the lid (3) is raised upwardly, the end of the tube system (4) serving as a guide. After the introduction of the film the lid is fixed to the lower part of the container by means of winged screws (5) and closed and thereby rendered gas-tight. The film spool (1), (several layers of film can be inserted), is situated in the container on a film spool holder, advantageously consisting of two metal bars (6) arranged crosswise. Closely under this film spool holder a rapidly running propeller (7), advantageously one having four blades, rotates, pressing the gas upwards, said propeller being fixed to the shaft (8) which is arranged vertically with respect to the plane of the spool holder (6), and which is driven, for instance, by an electric motor (9). Immediately under this propeller lies the bottom plate (10), favorably provided with cavities (11), which serve for the storing of the respective agents for the treatment. The vaporization of the said agents is effected by the very strong suction effect produced below the propeller by the rapid rotation of the same. Above the rotating propeller this suction effect becomes an equally strong pressure effect, and as such acts on the film. It is self-evident that the pressure is most effective when the diameter of the film wound up nearly corresponds to the diameter of the cross section of the apparatus. If the diameter of the film wound up is too small it is advisable therefore to arrange a ring on the film holder, the external diameter of which corresponds to that of the apparatus and the internal to that of the wound film, thus securing the highest pressure effect. The upper part of the container, i. e. the lid, is directly connected by means of a tube system (4), which is as short as possible and is given a large cross-section, say ½ to ¾ that of the container, with the lower part of the container, the bottom plate, with the result that a continuously circulating current of gas at a high pressure moves through the container and flows through and around all parts of the film simultaneously.

When it is intended that the agents employed in the treatment should act on the film in the form of a fine rain or spray an exhaustive quantity of the liquid used is poured on to the bottom plate and into the curvature of the lower tube system in an amount such that the circulating gases can still flow readily through the curvature. From this lowest point the liquid is forced upwardly through pipe 14 by means of a small pressure pump (12), which may be connected by means of a lever (13) to the propeller blade drive mechanism. The liquid emerges from the conduit pipe (14) of small diameter, say ¼ inch, and falls downwardly past the film on to the rapidly rotating propeller blades whereupon the drops are scattered into a fine spray and hurled back with great pressure against and over the film. The liquid, which falls past the propeller before being returned to the pump is filtered through the filter (15) with the result that only pure reagents are recirculated.

Before placing the film to be treated in the apparatus it is wound on a film drum, the side walls of which are kept quite narrow, as may be seen from Figure II, and in order to improve the permeability of the film roll, a soft thread is positioned between successive laps of rolled film. This thread forms a marginal space between each winding of

film, whereby the gaseous or spray-like reagents are given a ready means of access to each part of the film, thus subjecting all parts of the film to a simultaneous treatment. The wound auxiliary thread can, as desired, be either withdrawn from above or left between the film during the treatment. Instead of arranging a soft thread between each winding of the film, other suitable means may be arranged therein, for example, a thin flexible steel tape. It is self-evident that in case the auxiliary means cannot be easily penetrated by liquids or gases, it must be withdrawn before carrying out my process. The film thus preliminarily prepared is now brought into the treating chamber of the apparatus and there exposed to the respective agents, which operate at excess pressure on the film band in the form of gases or fine spray as above described.

I claim:

1. An apparatus for treating with reagents in the gaseous or liquid state films wound up with a space between the layers comprising a circular container provided with a gas-tightly closing lid, a film spool holder arranged within the container, closely arranged below the film spool holder in the container a propeller, means for rotating the propeller, a circular connection between the bottom and the lid of the container, said connection being formed by a tube of large cross-section, a pipe of small cross-section branched off from the lowest part of the circular connection between the bottom and the lid of the container, said branched pipe being introduced into the upper part of the container and terminating by a sprinkler and means for moving a liquid through said branched pipe.

2. An apparatus as claimed in claim 1, in which the film spool holder arranged within the container consists of two metal bars arranged cross-wise and in which the bottom plate of the container is provided with cavities.

In testimony whereof, I affix my signature.

MICHAEL SCHLÖMER.