Dec. 19, 1922. 1,439,378

S. PRESTON,
ROTATABLE SPIDER,
FILED MAR. 12, 1920.

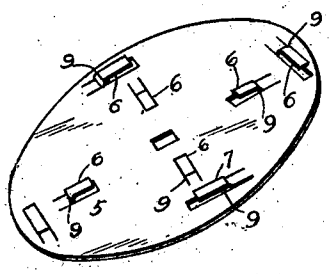


Fig. 3.

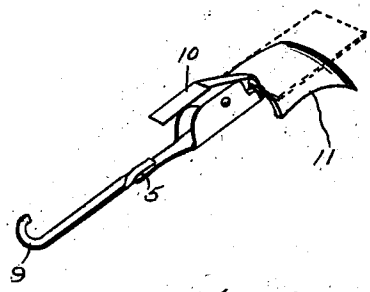
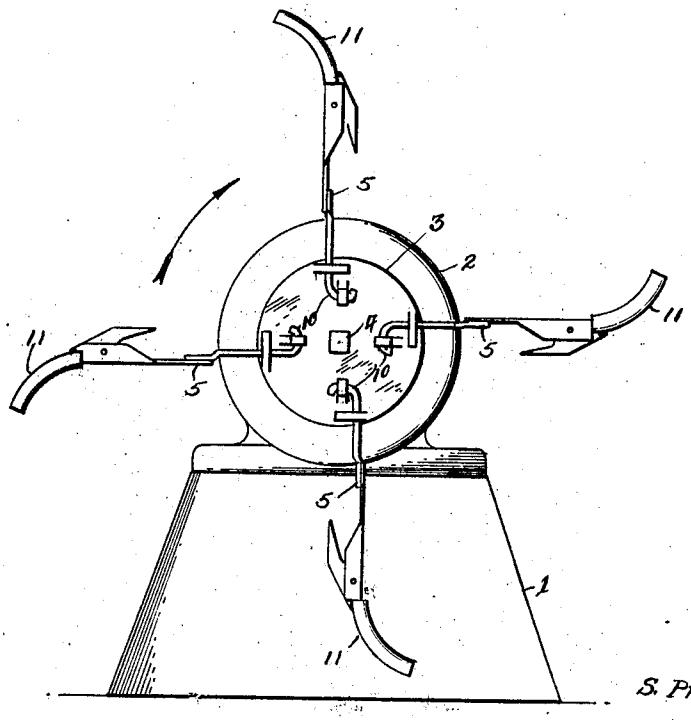


Fig. 2.

Fig. 1.



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By

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UNITED STATES PATENT OFFICE.

STEPHEN PRESTON, OF ROANOKE, VIRGINIA.

ROTATABLE SPIDER.

Application filed March 12, 1920. Serial No. 365,207.

To all whom it may concern:

Be it known that STEPHEN PRESTON, a citizen of the United States, residing at Roanoke, in the county of Roanoke and State of Virginia, has invented certain new and useful Improvements in Rotatable Spiders, of which the following is a specification.

This invention relates to rotatable driers, and more particularly to that class of rotatable driers which employ a spider, to the outer ends of the arms of which articles to be dried are affixed and revolved around a central shaft.

The prime object of my invention is to materially lessen the time for completion of photographic films after they have been subjected to treatment of developing and fixing solutions in common use in photographic work.

A further object of my invention is to so construct a rotatable device of the spider type as to make it particularly adapted to the freeing of salts and incidentally drying photographic films, overcoming the necessity for washing such films, which washing is necessary when other methods of finishing are used.

The further object is to construct a central or body portion of the spider in such manner that the films may be lifted from the fixing solution by the well known film clips or holders which are commonly used to suspend films in the solution from a support thereabove, and transfer the clips with the films held thereby to the body portion of the spider by slipping the hooked ends of the clips under spring clamps carried by the body portion of the spider.

A further object of my invention is to so position the films with relation to their movement through the air as to prevent accumulation of dust particles on the sensitized face of films which, at this stage, has been rendered soft by having been subjected to developing and fixing solutions.

A still further object of my invention is to prevent an annoying curling or twisting of films due to contraction of gelatin while drying is in progress.

My device is particularly adapted to clearing and drying X-ray films of teeth and their surrounding tissues, the use of which films has become a common practice by dentists in checking their work, and by dentists and physicians as an aid in diagnosis. As dentists' and physicians' offices are not universally equipped with X-ray apparatus, it often becomes necessary that patients be referred to a dental or general radiologist for such work. When a film is taken from the fixing solution its gelatin coated side has been rendered soft by being subjected to solutions and is therefore very easily marred. It therefore becomes necessary that the clearing and drying of films, thus again hardening the softened surface, be accomplished as quickly as possible in order that they may be delivered to the dentist or diagnostician who is to use them, in order that he may be informed of the condition of the teeth and adjacent tissues that he may determine as quickly as possible what conditions exist and so to facilitate prompt diagnosis and treatment.

In methods at present in use it is common when films are removed from solutions to suspend them in water for from fifteen to thirty minutes to dissolve out or wash away the heavy solution of salts used in developing process, and then to suspend them in air to be dried by evaporation. When such methods are used the time required for finishing films might be said to vary from an extreme minimum of thirty minutes to several hours, depending upon condition of air with relation to humidity. By use of my device the same end is accomplished even more satisfactorily in from three to four minutes.

After removing the films from fixing solution, without removing them from the clips, I pass them through water from, say three to five seconds, to dilute the solution remaining on films and to wash away such matter as will readily come away therefrom. While the step of passing them through water is not necessary it will be found advantageous. I then attach the hooked ends of the clips with the film still held thereby to the body of my improved spider, preferably with the hard or sensitized side of the film turned in the direction of the revolution of the spider. The spider is then rapidly revolved and the double purpose of clearing and drying is served the clearing, by centrifugal motion freeing the film of remaining salt solution, and drying by contact with the air.

While the surrounding air may seem to the naked eye to be absolutely free from dust, it is well known that this is not the fact, there always being small particles of matter carried by the air and when a sof-

tened photographic film is revolved about a shaft in such manner as to impact air against its sensitized surface these small particles are driven into such softened surface thereby marring it. By my method of rotating the film with the unsensitized face foremost, or in other words, causing air at high velocity to be impacted against the unsensitized face of the film, which surface with the wet film is hard, as compared with the sensitized face, the ruinous effect of the dust particles in the air is overcome.

It will be found that when films are cleared and dried by my method the tendency to twist or curl is satisfactorily overcome, this being due to film being forcibly held comparatively straight by centrifugal force during the drying process. This has been a vexatious problem for radiologists and heretofore unsolved.

In order that those skilled in the art to which my invention pertains may more clearly understand it, I will now describe it with reference to the accompanying drawings and reference characters thereon, which drawings form a part of this specification, it being understood that I make no claim for any part of the means for revolving the spider, my invention having to do with the spider per se, and the method of clearing and drying photographic films by the use thereof.

Figure 1 shows my improved rotatable spider mounted on the shaft of a motor.

Figure 2 is a perspective view of a film clip, which when attached to the center of the body portion of the spider, forms one of the arms thereof.

Figure 3 is a perspective view of the central or body portion of the spider.

Referring now to the reference characters, reference numeral 1 represents the base of a motor. 2 represents the motor proper, mounted thereon. 3 is a disc of spring metal forming the central or body portion of my improved spider, which is adapted to be affixed to the end of shaft 4 of motor 2, which disc 3 carries radial arms 8. Radial arms 8 may be made integral with the disc or may be affixed thereto in any suitable way, as, for instance, with screws, bolts, rivets, or soldered thereon, though in the preferred form of the invention, they are removably attached to the disc by inserting their inner ends under two leaflike springs 6 and 7, which lie at right angles to each other, and, in which instance, the ordinary film clips used for suspending the films in the developing and fixing solution form the arms 8. Springs 7 being placed intermediate springs 6 and the center of the disc and being on and parallel with the line of the greatest diameter of the disc 3. Disc 3 is preferably made of spring metal and the leaflike springs may be struck up therefrom or they may be attached thereto in any suitable manner, and are adapted to exert a clamping action on the inner ends of arms 8 between their inner faces and the outer face of disc 3 when the arms 8 are inserted thereunder as shown in Figure 1. Springs 7 act as anchors through their shoulders 9 to limit the tendency of outward movement of the arms 8, which tendency is produced by centrifugal force when the disc 3 is rapidly revolved around shaft 2. Arms 8 are formed with hook-like portions 10 on their inner ends, which hooklike portions engage shoulders 9 of springs 7, and are provided at their outer ends with clips 11 for engaging films 12. The shoulder 9 of springs 6 form fulcrums for arms 8 when the spider is revolved in the direction indicated by the arrow in Figure 1, thus firmly locking arms 8 against displacement.

Having thus described my invention what I claim is:

1. In a rotatable drier comprising a disc adapted to be affixed to a rotatable shaft, detachable radial arms carried by said disc, and spring means for positioning said arms on said disc.

2. A spider comprising a disc, detachable arms carried by said disc, and spring clamping means for securing said arms to said disc.

3. A spider comprising a disc, detachable arms carried by said disc, means integral with said disc for clamping said arms to said disc, and means for limiting the outward movement of said arms with relation to the center of said disc.

4. A spider comprising a disc, radial arms carried by said disc, spring means for clamping said arms to said disc, said arms being so shaped at their inner ends as to engage one of said means in such manner as to limit the outward movement of said arms with relation to the center of said disc.

5. The method of drying photographic films, which consists of rotating the film in a direction where the air impacts against the unsensitized face of the film.

In testimony whereof I affix my signature.

STEPHEN PRESTON.