L. DE FOREST.

ENDLESS FILM ARRANGEMENT.

APPLICATION FILED OCT. 21, 1919.

1,365,237. Patented Jan. 11, 1921.

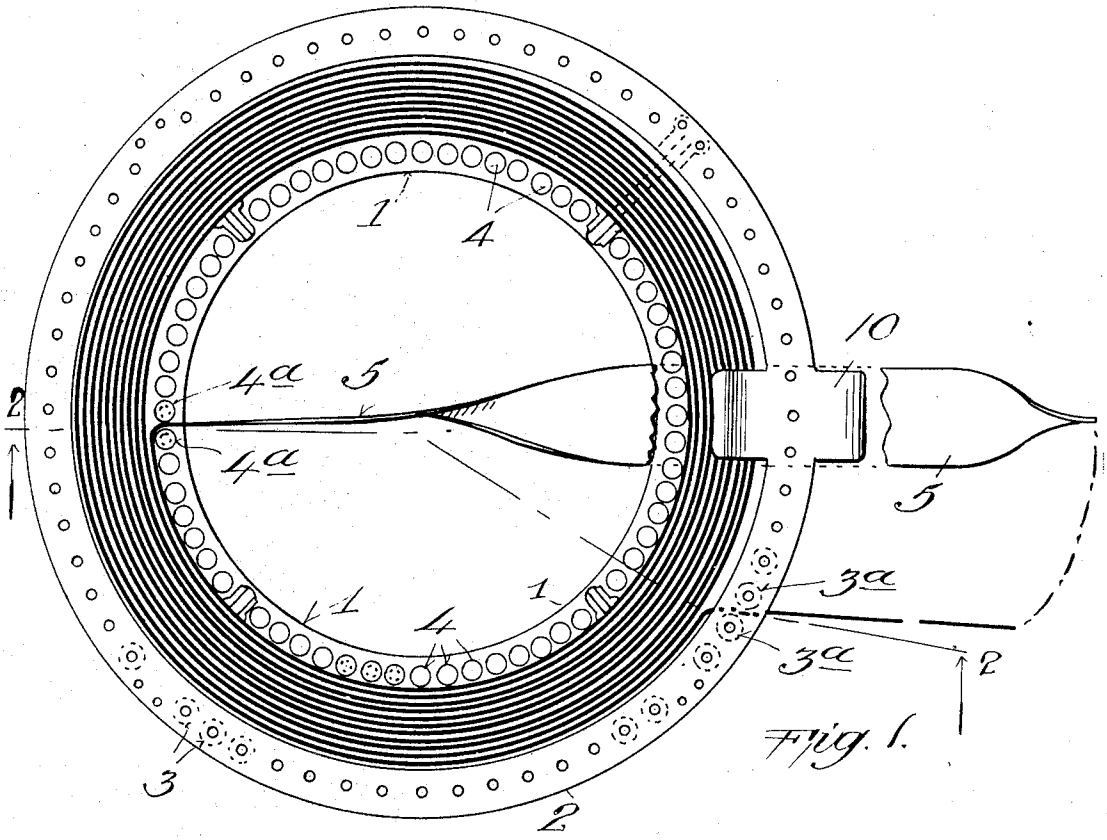

Fig. 1.

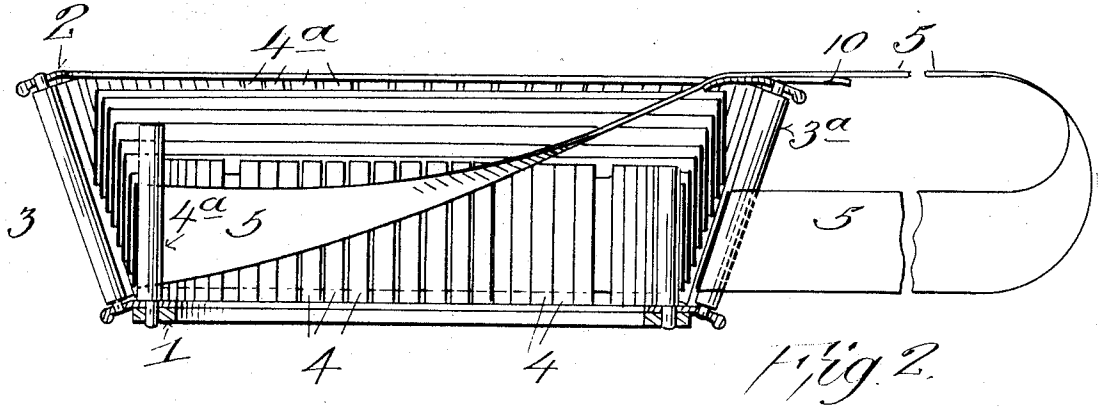

Fig. 2.

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ENDLESS-FILM ARRANGEMENT.

1,365,237. Specification of Letters Patent. Patented Jan. 11, 1921.

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To all whom it may concern:

Be it known that I, LEE DE FOREST, a citizen of the United States, residing at New York, county and State of New York, have made a certain new and useful Invention in Endless-Film Arrangements, of which the following is a specification.

This invention relates to an arrangement for enabling a continuous winding and unwinding of a film, ribbon, or the like, from and into a single coil, and has for its object the provision of means which will enable an endless film of exceedingly great length to be compactly placed in a relatively small area to enable its free movement in winding and simultaneous unwinding.

A further object of the invention is to provide means in an arrangement of this nature to impart constant linear speed to all parts of the coil irrespective of the diameter of the coil at any particular point.

Further objects of the invention will appear more fully hereinafter.

The invention consists substantially in the construction, combination, location and relative arrangement of parts, all as will be hereinafter set forth, as shown by the accompanying drawing, and finally pointed out in the appended claims.

Referring to the drawings:

Figure 1 is a plan view of a coil embodying my invention.

Fig. 2 is a sectional view taken on the line 2, 2, Fig. 2, looking in the direction of the arrows.

The same part is designated by the same reference character wherever it occurs throughout the several views.

In accordance with my invention I provide a pan, or the like, preferably open at the top and closed at the bottom, with diverging sides so that the bottom is of smaller diameter than the top, as clearly shown. While I do not desire to be limited or restricted as to the size or construction of the pan *per se* I have shown the same as formed by a base member 1 and a ring shaped rim 2, the base 1 and the ring 2 forming journals for a plurality of rollers 3 extending circumferentially around the pan for free rotative movement. It will be observed that these rollers form in effect the wall of the pan. Mounted in the periphery of the base 1 to extend vertically upward in the pan are a plurality of vertical rollers 4 journaled in the base 1, as clearly shown, for free rotative movement. It will be observed that the rollers 3 and the rollers 4 form between them a substantially V-shaped recess in the pan, in which recess the film, ribbon, or the like, is coiled. The film, ribbon, or the like, indicated at 5, is fed into the pan to the periphery of the coil of film located in the V-shaped recess between any desired pair of slanting rollers, for example, between the rollers 3^a, see Fig. 1, and the film is led out of the innermost turn of the coil between vertical rollers 4^a, which vertical rollers 4^a are preferably longer than the vertical rollers 4 to insure the film, ribbon, or the like, 5, being retained in position between the rollers when a pull is exerted thereon. Thus it will be seen that if the film, ribbon, or the like, 5, is pulled or advanced in any manner, for example, by the usual intermittent advancing film mechanism where motion picture film or the like is employed, or by a motor, or the like, the entire coil of film, ribbon, or the like, 5, will revolve around the axis of the pan, the inner coil discharging out of the pan from between the rollers 4^a, and back into the pan between the rollers 3^a to the outer periphery of the coil contained in the V-shaped recess therein formed between the respective rollers as above described. By means of the roller arrangement the friction between the film, ribbon, or the like, 5, is minimized and the shape of the recess between the rollers and the tension imposed upon the film or ribbon maintains the same within the pan in a perfect coil causing the film coils to gravitate to their inner position upon rotation of the coil and at the same time causing all parts of the coil to rotate at the same linear speed.

The utility of such an arrangement of endless film or ribbon is believed to be obvious, for example, motion picture film can be continuously operated, that is, one reel can be operated continuously without interruption through a projection machine or camera without the attention of an operator. Likewise, in the case of film recorded sound a continuous record of great length can be retained in a small space and continuously operated and repeated as required.

In the form shown I prefer to form a lip 10 on the rim 2 of the pan with slightly downwardly curved edges, which lip I prefer to locate diametrically opposite the rollers 4^a from between which the film or ribbon is discharged. The purpose of the lip

is to guard against the film or ribbon 5 becoming injured in passing over the rim 2 and at the same time to guard against any tendency of the outer turns of the coil from jumping out of the pan, which tendency, where it exists, is obviously restricted to the first few outer turns of the coil inasmuch as the tension and weight of the outer turns of the coil retain the inner turns of the coil in place.

Many modifications and changes in detail will readily occur to those skilled in the art without departing from the spirit and scope of my invention as defined in the claims.

Therefore what I claim as new and useful and of my own invention and desire to secure by Letters Patent is,—

1. In a device of the character described, the combination with a circular pan formed with a diverging peripheral wall, and a base provided with a partition to form a recess between the wall and partition to accommodate a coil of ribbon therein, substantially as and for the purpose described.

2. In a device of the character described, the combination with a circular pan formed with a diverging peripheral wall, and a base provided with a partition to form a recess between the wall and partition to accommodate a coil of ribbon therein, substantially as and for the purpose described, and means for minimizing the friction between the coil and the wall of said pan.

3. In a device of the character described, the combination with a circular pan formed with a diverging peripheral wall and a base provided with a partition to form a recess between the wall and partition to accommodate a coil of ribbon therein, substantially as and for the purpose described, and means for minimizing the friction between the inner turn of said coil and said partition.

4. In a device of the character described, the combination with a circular pan formed with a diverging wall of rollers, and a base provided with a partition to form a diverging recess between the wall and partition to accommodate a spiral coil of ribbon therein.

5. In a device of the character described, the combination with a circular pan formed with a diverging peripheral wall, and a base provided with a partition to form a recess between the wall and partition formed of vertically extending rollers to form a substantially V-shaped recess between the wall and partition to accommodate a coil of ribbon therein.

6. In a device of the character described, the combination with a circular pan formed with a diverging wall of rollers, and a base provided with a partition formed of vertically extending rollers to form a substantially V-shaped recess between the wall and partition to accommodate a coil of ribbon therein.

7. In a device of the character described, the combination with a circular pan formed of rim and base members, said base member being of smaller diameter than the rim member, a plurality of rollers journaled in said members and extending therebetween, and a plurality of substantially vertically extending rollers supported by said base member to form a substantially V-shaped recess between the two sets of rollers.

8. A coiled endless ribbon mounted in a receptacle for axial rotation therein, said receptacle having its peripheral walls outwardly flared substantially as and for the purpose set forth.

9. A coiled endless ribbon mounted in a conical receptacle, and means for unwinding said ribbon from the inner circumference of the coil and for winding the same onto the outer circumference of the coil, and means for causing the ribbon to gravitate toward the inner circumference of the coil.

10. An axially rotatable coiled endless ribbon mounted in a flat bottom receptacle, the peripheral wall of which is inclined outwardly relative to the bottom thereof, substantially as and for the purpose described.

11. An axially rotatable coiled endless ribbon mounted in a receptacle, the peripheral wall of which is inclined outwardly relative to the bottom thereof substantially as and for the purpose described.

In testimony whereof I have hereunto set my hand on this 15th day of October, A. D. 1919.

LEE DE FOREST.