April 25, 1939. J. M. WEHNER 2,155,518

FILM SPROCKET

Filed Jan. 29, 1937

FIG. 1.

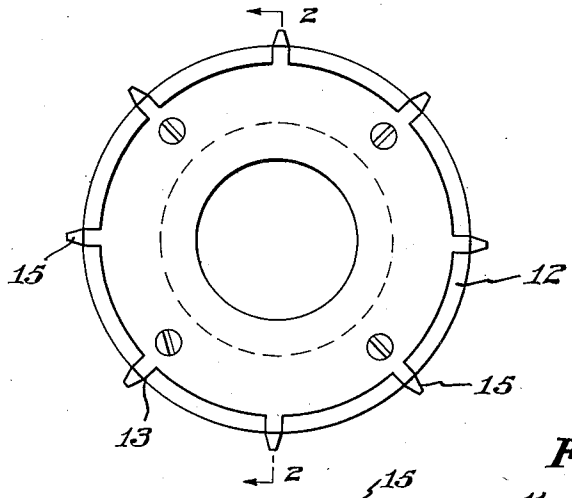


FIG. 2.

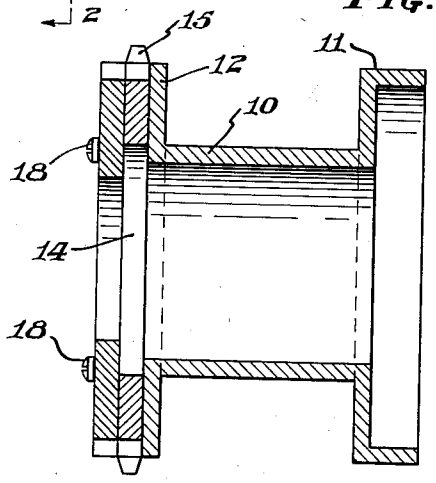
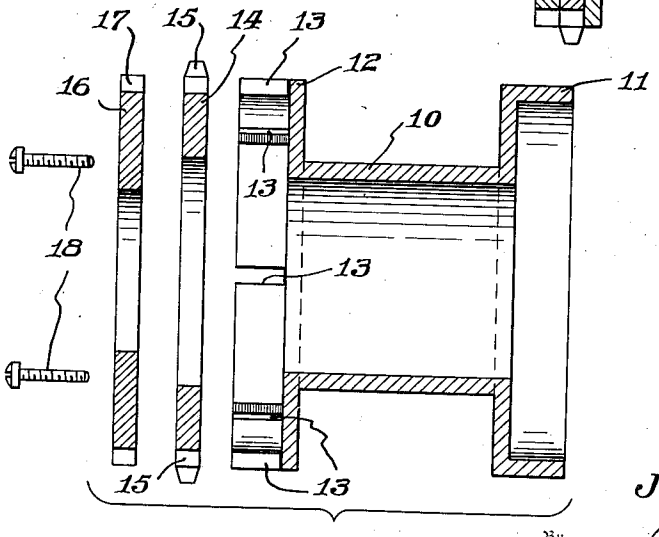


FIG. 3.



By

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Patented Apr. 25, 1939

2,155,518

UNITED STATES PATENT OFFICE

2,155,518

FILM SPROCKET

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Application January 29, 1937, Serial No. 122,941

8 Claims. (Cl. 74—243)

This invention relates to new and improved sprockets, and more particularly to the type of sprockets used for feeding perforated motion picture film.

Film sprockets, as constructed according to the prior art, were customarily turned from a solid bar of stock and the teeth were thereafter milled. In the course of milling of the teeth, and in order to secure a proper contour to the faces thereof contacting with the edges of the perforation in the film, it was necessary for the milling cutter to pass below the surface of the sprocket drum adjacent to the teeth, thereby leaving objectionable sharp edges adjacent the teeth. In attempting to avoid these objectionable sharp edges, which tended to cut the film at the corners of the sprocket holes and thereby cause film breakage, various schemes have been resorted to, none of which have been found entirely satisfactory.

The purpose of my invention is to provide a sprocket wherein the surface of the sprocket drum is perfectly smooth and free from irregularities while the teeth may be made to any desired degree of precision and inserted in the said drum as a unit. This is accomplished by making the drum of the sprocket integral with the hub and turned smooth on the outside to the requisite degree of precision. This drum is then slotted longitudinally and the tooth unit is inserted therein with the teeth projecting above the slots the required amount, and the remainder of each slot is then fitted in so as to be smooth with the surface of the drum by means of a second member provided with radial extensions adapted to fit the slots.

One object of the invention is to provide a sprocket which will be free of irregularities which might tend to damage the film.

Another object of my invention is to provide a sprocket which may be made to a high degree of precision.

Another object of my invention is to provide a sprocket which may be readily fabricated by simple machinery.

Another object of my invention is to provide a sprocket wherein the sprocket teeth and the sprocket drum may be made of different materials particularly adapted to the specific purposes.

Other and incidental objects of my invention will be apparent to those skilled in the art from a reading of the following specification and an inspection of the accompanying drawing, in which:

Figure 1 is an end view of my improved sprocket.

Figure 2 is a longitudinal section of my improved sprocket showing a form thereof adapted for use with standard 16 mm. film, and

Figure 3 is an exploded longitudinal section of my sprocket.

As shown in the several figures of the drawing, the sprocket comprises a body member 10 having at its end drum members 11 and 12, these three portions of the sprocket being preferably formed from a single piece of material, although they may be fabricated from a plurality of parts if so desired.

Since, in the form of the invention shown, the sprocket is intended to operate with 16 mm. film, which has sprocket holes only along one edge, sprocket teeth are shown only at the corresponding end of the sprocket. It will be apparent, however, that the sprocket may be made in any size desired and sprocket teeth may be provided at both ends of the sprocket if so desired, as, for example, to operate with standard 35 mm. film.

The drum 12 is slotted longitudinally as shown at 13, so as to provide room for the sprocket teeth to be inserted in the slots with a snug fit. An annular member 14, which has a circumference of such diameter as to fit snugly within the drum 12, is provided. Teeth 15 extend from this circumference and are so shaped that they extend with parallel sides through the slots 13 to the surface of the drum 12, completely filling the slots in the circumferential direction, and fitting snugly against the bottom of the slots. The teeth are so shaped as to have the proper contour above the surface of the drum 12. It will be apparent that any diametrically opposed pair of teeth 15 will, by reason of the snug fit in the corresponding slots 13, definitely determine the extended position of the pair of teeth located at 90° to this diameter. For this reason the external diameter of the member 14 may vary within wide limits without affecting the accuracy of the positioning of the teeth.

This annular member 14 may be made of any desired material, as, for example, a steel which may be shaped and then hardened and ground to finished dimensions, whereas the members 10, 11 and 12 may be made of a somewhat softer grade of steel in order to machine readily to the required degree of precision.

A second annular member 16 may be provided, if desired, which, like the member 14, has a circumference adapted to fit within the drum 12. Extending beyond this circumference are the pro-

jections 17, which, like the bases of the teeth 15, are made with parallel sides of such dimensions as to fit snugly into the slots 13. The outer surfaces of the projections 17 are turned to the same radius as the outer surface of the drum 12, and therefore serve to fill the slots 13 both circumferentially and radially, so as to render the true surface of the composite member, including the members 12, 14 and 16, perfectly smooth. The member 16 is, further, made of such thickness as to just fill the portion of the depth of the drum 12 which remains after the insertion of the member 14. When the member 14 is inserted into the member 12 with the teeth 15 projecting into the slots 13, and the member 16 is inserted into the member 12, with the projections 17 filling the slots 13, there is produced a sprocket which is perfectly smooth and uniform over the entire surface of the drum 12, with no apertures or extending members adjacent to the edges of sprocket 15. The member 16, however, is not essential and may be omitted.

The members 14 and 16 may be secured within the drum 12 either by making them of such dimensions as to be a press fit, by spinning down an edge of the drum 12 over the edge of the member 16, by soldering or riveting the elements together, or, preferably, by means of the screws 18 as indicated. The use of screws to secure these members together permits the members 16 and 14 to be removed and, in case of wear on the faces of sprocket 15, the member 14 may be replaced without replacement of the remainder of the sprocket.

I claim as my invention:

1. A sprocket of the class described comprising a cylindrical drum having longitudinal slots therein, an annular member fitting within said drum and having sprocket teeth thereon passing through said slots, and means for securing said members to said drum.

2. A sprocket of the class described comprising a cylindrical drum having longitudinal slots therein, and an annular member fitting within said drum and having sprocket teeth thereon passing through said slots, the base portions of said sprocket teeth completely filling said slots circumferentially.

3. A sprocket of the class described comprising a cylindrical drum having longitudinal slots therein, an annular member fitting within said drum and having sprocket teeth thereon passing through said slots, and a second annular member fitting within said drum and having projections thereon extending into and filling the portions of said slots adjacent to the said teeth.

4. A sprocket of the class described comprising a cylindrical drum having longitudinal slots therein, an annular member fitting within said drum and having sprocket teeth thereon passing through said slots, a second annular member fitting within said drum and having projections thereon extending into and filling the portions of said slots adjacent to the said teeth, and means for securing said members together.

5. A sprocket of the class described comprising a cylindrical drum having longitudinal slots therein, an annular member fitting within said drum and having sprocket teeth thereon passing through said slots, and a second annular member fitting within said drum and having projections thereon extending into and filling the portions of said slots adjacent to the said teeth, the base portions of said sprocket teeth completely filling said slots circumferentially.

6. A sprocket of the class described comprising a body member having a hollow cylindrical drum at its end, said drum being provided with longitudinal slots, and an annular member having a circumference of such diameter as to fit snugly within said drum, said member having sprocket teeth thereon passing through said slots.

7. A sprocket of the class described comprising a body member having a hollow cylindrical drum at its end, said drum being provided with longitudinal slots, and an annular member having a circumference of such diameter as to fit snugly within said drum, said member having sprocket teeth thereon extending radially therefrom in the plane thereof, and said sprocket teeth passing through said slots.

8. The invention set forth in claim 7 characterized in that said sprocket teeth have parallel sides adjacent said circumference and having converging sides beyond said parallel sides, and characterized further in that said parallel sides extend through said slots to only the surface of said drum, said converging sides alone extending beyond said drum surface.

JOHN M. WEHNER.