

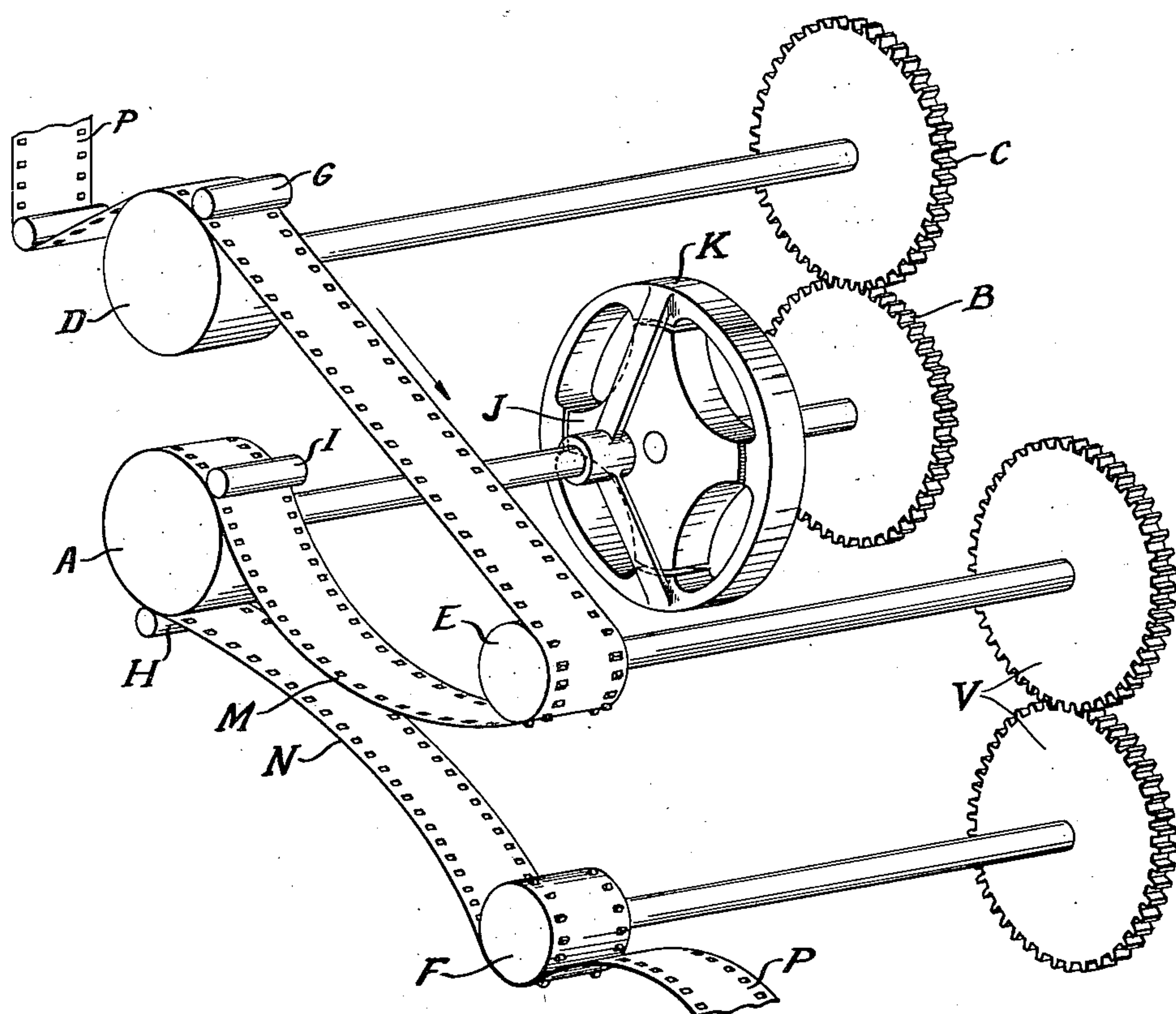
Oct. 31, 1950

R. SCHWAYDER

2,528,184

FILM DRIVE

Filed Dec. 22, 1945



INVENTOR  
Robert Schwayder

BY  
*Edward J. Brown*  
ATTORNEY



# UNITED STATES PATENT OFFICE

2,528,184

## FILM DRIVE

Robert Schwayder, Paris, France, assignor to  
Etablissements Edgar Brandt, Paris, France, a  
body corporate of France

Application December 22, 1945, Serial No. 637,051  
In France December 26, 1944

7 Claims. (Cl. 271—2.3)

1

This invention relates to sound film pick-up and recording devices and especially to improvements in means for driving a film through such an apparatus.

It is the object of this invention to provide means for driving a film with a uniform speed proportional to its linear speed in a film-drive apparatus comprising feed sprocket wheels.

The essential condition for satisfactorily taking a sound record on a film, or picking it up therefrom, is to provide for a uniform travelling speed of the film at that point thereof where the record is to be taken or picked up.

In order to comply with that condition, a feed sprocket wheel is generally employed for pulling the film. The latter, acting in belt-like fashion, drives a drum connected with a flywheel. The momentum of the flywheel acts against variations in the speed of the film. It is only necessary to take the record or pick it up at that point.

Such an arrangement suffers from certain inconveniences: in particular, since a film never adheres perfectly to the drum, and some slip takes place to render the flywheel less effective. It has been proposed, in order to obtain a satisfactory result, to drive the drum and its flywheel mechanically through a yielding connection and to let said drum and flywheel provide for the feeding of the film at the place where the record is being taken or picked up. Such an arrangement works satisfactorily as far as a blank and fresh-made film is concerned; but it is useless with an old, developed film. Effectively, depending on the temperature, the moisture content of the air, and the weather, a film shrinks as much as 0.5%. Consequently, the pitch of the film perforations becomes less than the pitch of the feed wheel sprockets. The play of the feed wheel sprockets in the perforations of the film allows the latter to slip on the feed wheel races, and its speed is less than that of said races. On the other hand, the linear speed of the smooth drum which operates to feed the film, is equal to that of the feed wheels. Consequently, an apparatus with a driven smooth drum and feed sprocket wheels to feed the film cannot operate successfully; the film must either slip or break.

This invention eliminates these inconveniences. According to the invention, the pick-up drum is driven through the medium of a yielding coupling and a gear train by a drum which is driven by the film in a belt-like fashion.

Since the diameters of the driving and the pick-up drums in the arrangement of the inven-

2

tion, are exactly equal, the speed of the pick-up drum is the same as that of the film, and the record can be picked up or taken on the film upon said pick-up drum, between a pair of loops formed by the film ahead of and below the pick-up drum. Recording or picking up thus takes place under satisfactory conditions, safe from gear or feed sprocket wheel disturbances.

A preferred embodiment of this invention will now be described, reference being had to the appended drawing wherein the invention is illustrated in a diagrammatic perspective view. The mechanism employed is as follows: the film P pulled by a sprocket wheel E drives a primary smooth drum D over which it passes and against which it is urged by pressure rollers G; said drum D in turn drives a flywheel K through the medium of gear train C and B and a damper J (e. g. a magnetic coupling). Keyed to the shaft of said flywheel K is an additional or pick-up drum A having the same diameter as the drum D and against which the film is urged by rollers I and H. It is on this drum A that the sound is recorded and picked up. After it has passed over the drum A, the film P passes over a second sprocket wheel F, adapted to drive the film, and operatively connected through gear train V with the first sprocket wheel E to cause the two sprocket wheels E and F to rotate constantly at the same peripheral speed. The length of the portions M and N of the film P, between sprocket wheels E and F, that is, on each side of the pick-up drum A, is selected so that, whatever the variations in the spacing of the film perforations may be, these portions M and N are in an untaut condition to form loops.

The film P passes onto and is taken off from the pick-up drum A at a uniform speed without the portions M and N of the film being stretched at any time. This eliminates the transmission of sudden impulses to the pick-up drum A as well as variations in speed due to the film being worn.

The film can be made to fit closely on drum D, as it should, for good operation, without influence of flywheel K. The loops M and N before and after the pick-up drum A may bulge to a greater or less extent, while the damper J avoids reactions being transmitted from the gear train B, C, to the pick-up drum A. A uniform unwinding of the film is thus secured at the pick-up point and the result aimed at is thus attained.

It is to be understood that this embodiment is given by way of example; thus, for example the magnetic coupling may be replaced by a fluid coupling or by other suitable means and the pick-



3

up drum may be located either ahead of or following the driving sprocket-wheel.

What I claim as my invention and desire to secure by Letters Patent is:

1. In a device for driving a film, a smooth drum driven by said film, a second smooth drum of the same diameter as the first mentioned drum and arranged for pick-up and sound recording purposes, said film passing successively over said drums, and driving means associated with said first mentioned drum for driving said second mentioned drum synchronously therewith.

2. In a device for driving a film provided with sprocket tooth openings in which the film is engaged by a sprocket wheel and passes over a smooth pick-up or sound recording drum, a second smooth drum of the same diameter as said pick-up drum and arranged to be driven by said film, and driving means connected with said second drum for driving said pick-up drum synchronously therewith.

3. In a device for driving a film provided with sprocket tooth openings, in which the film is engaged by a sprocket wheel and passes over a smooth pick-up or sound recording drum, a second smooth drum of the same diameter as said pick-up drum and arranged ahead of said sprocket wheel and adapted to be driven by the passage of the film thereover, said film passing successively over said second drum, said sprocket wheel and said pick-up drum, and means associated with said second drum for driving said pick-up drum synchronously therewith.

4. In a device for driving a film as claimed in claim 3 in which the means for driving said pick-up drum comprises a drive shaft for said second drum, a gear wheel on said drive shaft, a second gear wheel in mesh with and of the same diameter as said first gear wheel, a shaft on said second gear wheel, a drive shaft on said pick-up drum, and a resilient coupling between said drive shaft of said second gear wheel and said drive shaft on said pick-up drum.

4

5. In a device as claimed in claim 4 a second sprocket wheel of the same diameter as and geared to said first sprocket wheel and arranged to engage said film after its passage over said pick-up drum.

6. In an apparatus for driving a film for recording and reproduction purposes, the combination comprising rotational means for unwinding film, a first rotatable drum, means for passing said unwinding film over said first drum to effect a rotation thereof at a given speed by the passage of the film thereover, a second drum disposed for coaction with an intelligence translating device, means for driving said second drum at substantially said given speed coupled to said first drum including oscillation attenuation means, said film passing from said rotational means over said second drum, and means for continuously taking up film from said second drum, said film forming a loop between said drum and said unwinding and said taking up means respectively.

7. Apparatus according to claim 6, wherein said driving means includes a shaft each for said first and said second drum, a gear train coupling said shafts, and said oscillation attenuation means includes a flywheel and a resilient drive coupling linking the shaft of said second drum and said gear train.

ROBERT SCHWAYDER.

#### REFERENCES CITED

The following references are of record in the file of this patent:

#### UNITED STATES PATENTS

| Number    | Name      | Date           |
|-----------|-----------|----------------|
| 1,756,864 | Hoxie     | Apr. 29, 1930  |
| 1,827,588 | Kellogg   | Oct. 13, 1931  |
| 1,892,554 | Kellogg   | Dec. 27, 1932  |
| 2,093,899 | Weber     | Sept. 21, 1937 |
| 2,102,895 | Hasbrouck | Dec. 21, 1937  |
| 2,133,820 | Kellogg   | Oct. 18, 1938  |
| 2,210,372 | Kolb      | Aug. 6, 1940   |