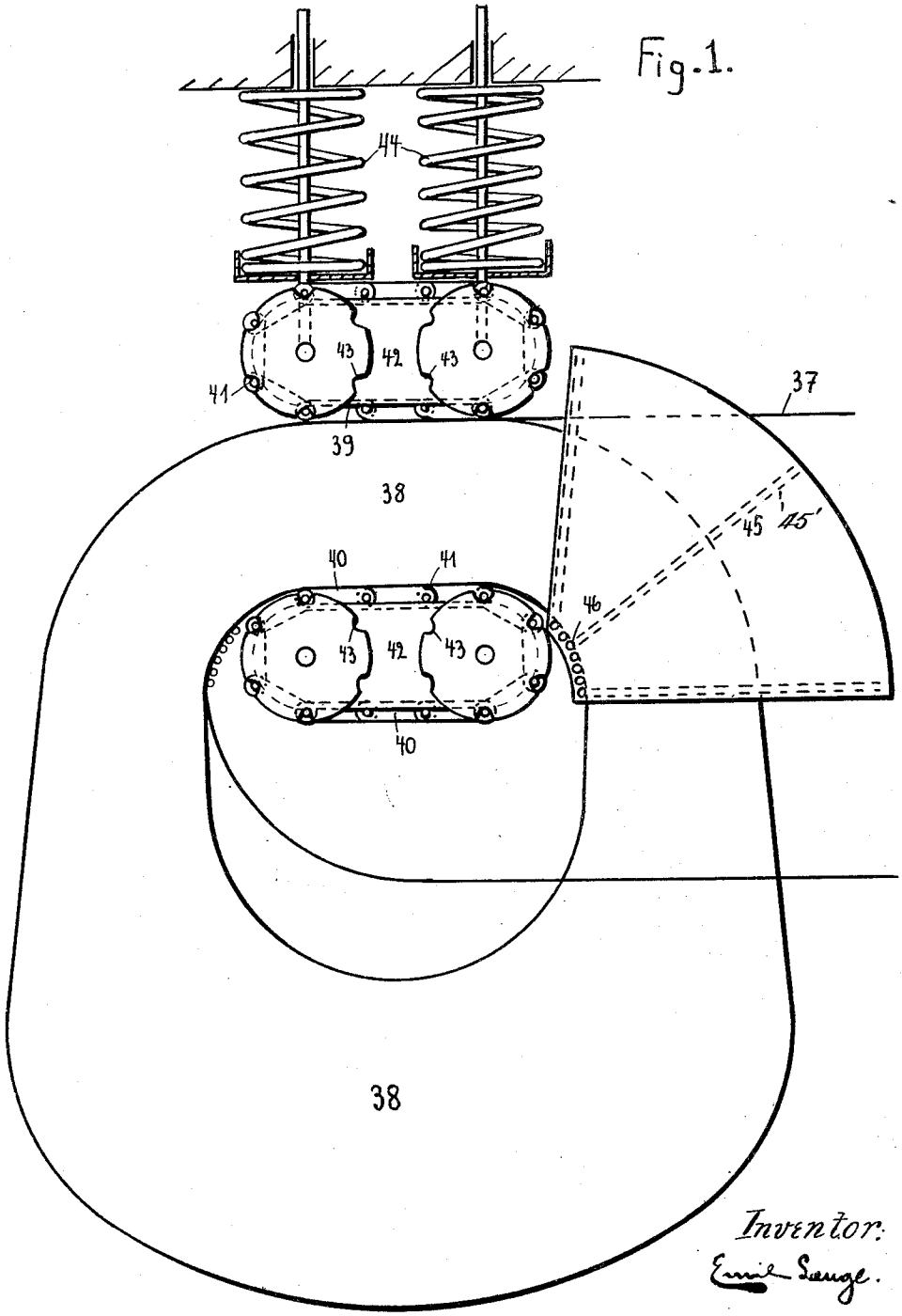
April 20, 1937. E. LANGE 2,077,843

CONTRIVANCE FOR THE SIMULTANEOUS WINDING-UP AND UNWINDING OF AN ENDLESS FILM STRIP

Filed March 22, 1933 3 Sheets-Sheet 1

Fig. 1.



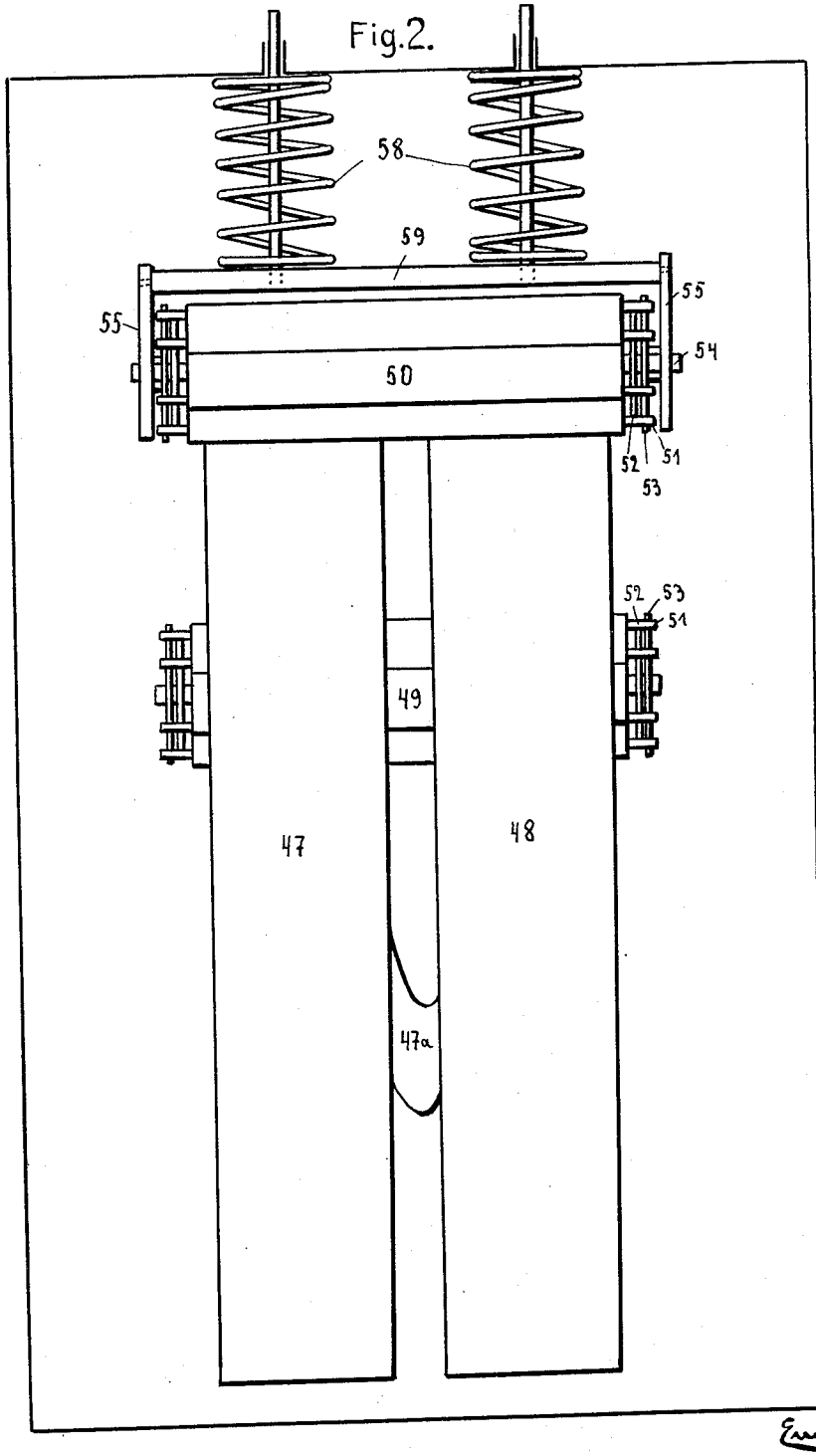
Inventor:
Emil Lange.

April 20, 1937. E. LANGE 2,077,843

CONTRIVANCE FOR THE SIMULTANEOUS WINDING-UP AND UNWINDING OF AN ENDLESS FILM STRIP

Filed March 22, 1933 3 Sheets-Sheet 2

Fig.2.



Inventor:
Emile Lange.

April 20, 1937. E. LANGE 2,077,843

CONTRIVANCE FOR THE SIMULTANEOUS WINDING-UP AND UNWINDING OF AN ENDLESS FILM STRIP

Filed March 22, 1933 3 Sheets-Sheet 3

Fig.3.

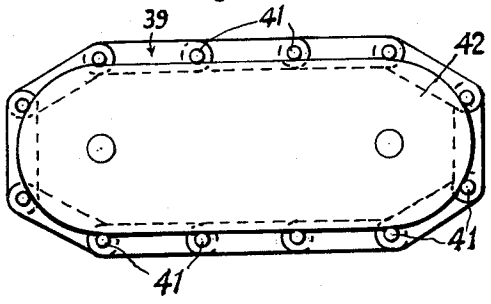


Fig.4.

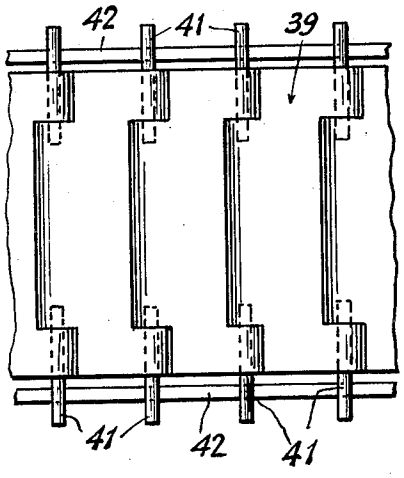
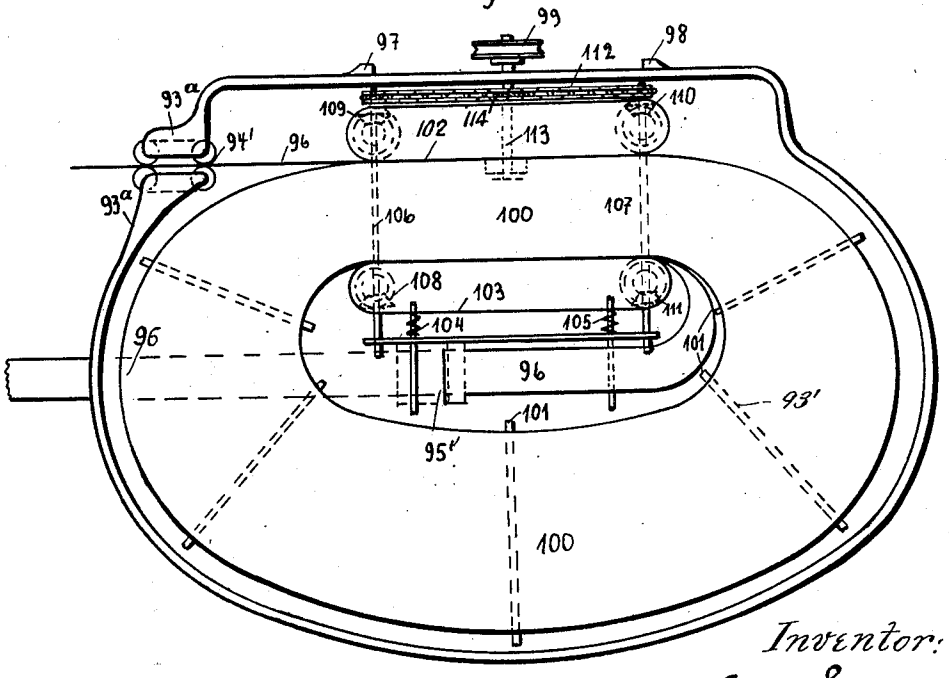


Fig.5.



Inventor:
Emil Lange

Patented Apr. 20, 1937 2,077,843

UNITED STATES PATENT OFFICE

2,077,843

CONTRIVANCE FOR THE SIMULTANEOUS WINDING-UP AND UNWINDING OF AN ENDLESS FILM-STRIP

Emil Lange, Berlin-Zehlendorf, Germany

Application March 22, 1933, Serial No. 662,131
In Germany March 23, 1932

2 Claims. (Cl. 88—18.7)

Endless cinematographic films in the form of loosely wound coils, and feeding devices for such films in the form of pairs of rollers adapted to clamp the coil convolutions in one portion of the coil firmly together and to maintain the convolutions in the remainder of the coil properly spaced and free for frictionless relative displacement, are already known.

In order to prevent the film from being scratched and worn, it is essential that the clamped film portions should be kept perfectly free from relative displacement, and this is not altogether possible with the use of feed rollers as just described, particularly if the film is of substantial length.

The object of the present invention is to obtain a feeding device by means of which endless films of any length can be fed in a perfectly satisfactory manner, and the invention consists in the employment of feeding elements in the form of endless, spring-pressed, travelling belts between which the film convolutions are clamped.

Fig. 1 of the accompanying drawings represents a diagrammatic view of a film-feeding device constructed according to the invention,

Fig. 2 is a view of a modification,

Fig. 3 is a side view of one of the feeding elements,

Fig. 4 is a fragmentary plan view thereof, and

Fig. 5 is a view of an open casing showing a modified coil-feeding arrangement.

The endless cinematographic film is formed into a loosely wound, annular coil one portion of which is according to the invention clamped between feeding elements in the form of endless, spring-pressed, travelling belts which impart to the coil the necessary feeding movement, the belts being arranged so that the coil portion engaged between them will be perfectly straight and so that relative displacement of the compressed and travelling film layers will be obviated. Owing to the loose winding of the coil, the convolutions will, outside the reach of the feed belts, be in spaced relation to one another and free for frictionless relative displacement. In this manner an endless film of any desired length can be fed through a projection apparatus with very little wear.

The belts are preferably composed of plates **39** which are hinged together like chain links, as best shown in Fig. 4. The hinge pins **41** project from the ends of the plates and engage in notches **43** in the driving and supporting discs, the pins are also adapted to ride on the edges of laterally disposed guide plates **42**. The belt at the outer side of the coil is controlled by springs **44** which press the belt to the coil and clamp it to the belt **40** which is rigidly supported. In order to maintain the film layers in proper alignment as they pass in between the belts, lateral, sector-shaped guides **45** are provided which bear against the coils by means of rollers **45'**. There are also rollers **46** arranged inside the coil for guiding the latter on to and away from the feeding belts.

In the case of a very long film, the latter may be divided into two or more sections arranged side by side either on the same or on different feeding rollers or belts travelling in synchronism. Fig. 2 shows an arrangement wherein two coils **47** and **48** are supported and fed by means of two belts **49** and **50** the latter of which is controlled by springs **58** arranged to bear against a bridge **59** which connects two laterally disposed belt protecting plates **55**. The latter are mounted on the shafts of driving discs **53** having notches for engagement with the hinge pins **51**, the latter being adapted to ride on the edges of guide plates **52**. In this case the film passes through the projection gate from the outside of one coil section to that of the other, and the inner coil convolutions **47a** are subjected to a similar transfer in the opposite direction.

Instead of suspending the film coil in a vertical position, a coil may be placed horizontally on suitable supporting rollers. Such an arrangement is shown in Fig. 5. The casing **93a** is provided with horizontally disposed rollers **93'** whereon the film coil **100** is supported. The slits **94'** and **95'** through which the film **96** passes into and out of the casing are arranged one at the circumference of the casing and the other in the bottom wall thereof. The feeding device consists of endless belts **102** and **103**, the latter of which is controlled by springs **104** and **105** as shown diagrammatically in the drawings. Driving shafts **106** and **107** are fitted with bevelled pinions **108**, **109**, **110** and **111** for engagement with corresponding bevel gears mounted on the shafts of the belts. The pinions **108** and **111** are slidably feathered on the shafts so that they can follow the displacements to which the belt **103** is subjected by the springs. The driving shafts receive their motion by means of a chain **112** from a sprocket wheel **114** mounted together with a driving pulley **99** on a shaft **113**. The casing is provided with brackets **97**, **98** to which a lid can be hinged.

The external part of the film is preferably guided between endless bands of soft material mounted in the projector, and means are provided

allowing the film to be brought by a movement in lateral direction, into and out of engagement with the driving and guiding elements of the projector so that no cutting of the endless film will be required.

I claim:—

1. A device for feeding loosely coiled, endless cinematographic films, comprising a pair of endless travelling belts composed of hingedly connected plates, supporting rollers for said belts, a support for said rollers, said rollers being relatively adjustable for admitting a portion of the film coil between the belts, means for driving the belts at the same linear speed, and springs acting on the rollers of one belt for clamping the belts to the admitted coil portions.

2. A device for feeding loosely coiled endless cinematographic films, comprising a pair of endless travelling belts, supporting rollers for said belts having notched edges, a support for said rollers, said rollers being relatively adjustable for admitting a portion of the film coil between the belts, springs acting on the rollers of one of the belts for clamping the latter to the admitted coil portion, each belt being composed of plates having hinge eyes, hinge pins connecting said plates by engagement with the eyes and having projecting ends adapted to engage in the notches of said rollers, means for imparting motion to the rollers so as to drive the belts at the same linear speed, and plates arranged between the supporting rollers as guides for the pins.

EMIL LANGE.