Dec. 4, 1923. 1,476,206

I. KITSEE

APPARATUS FOR RULING PHOTOGRAPHIC FILMS

Filed July 26, 1921 2 Sheets-Sheet 1

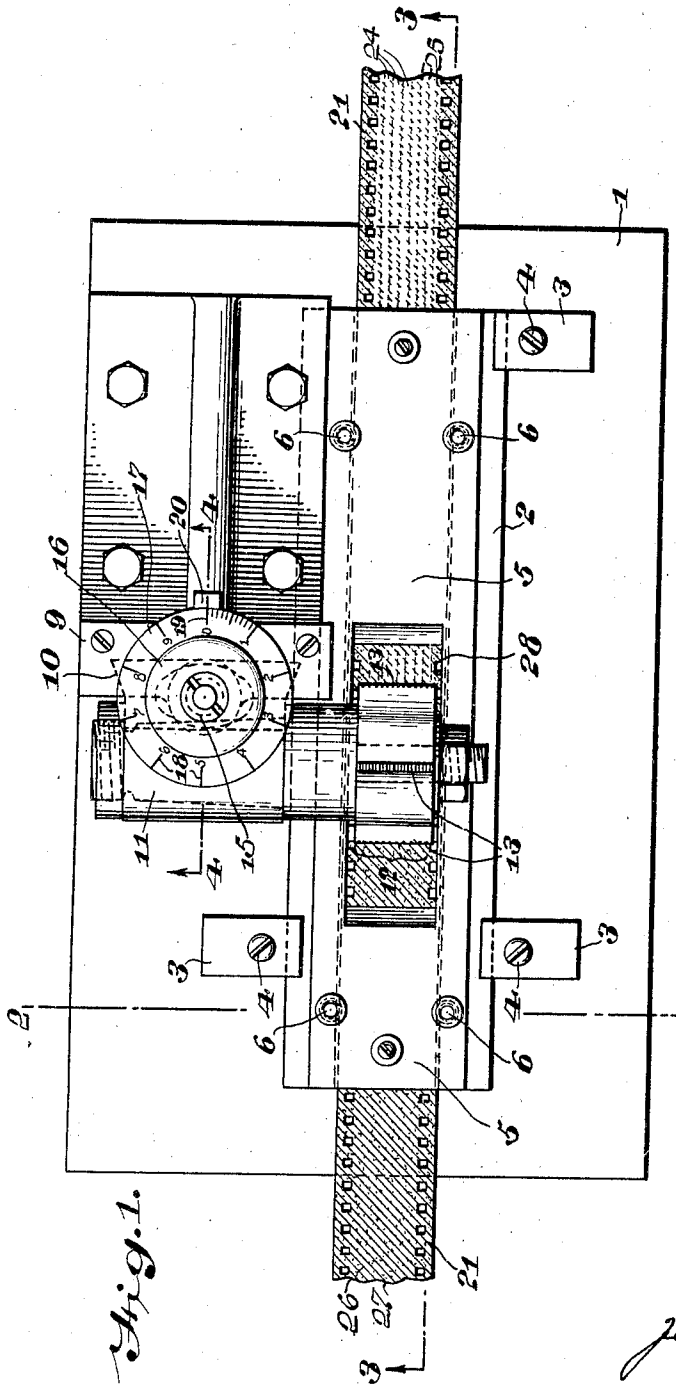


Fig. 1.

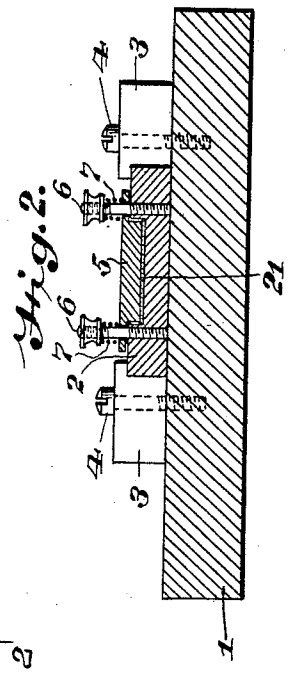


Fig. 2.

INVENTOR.

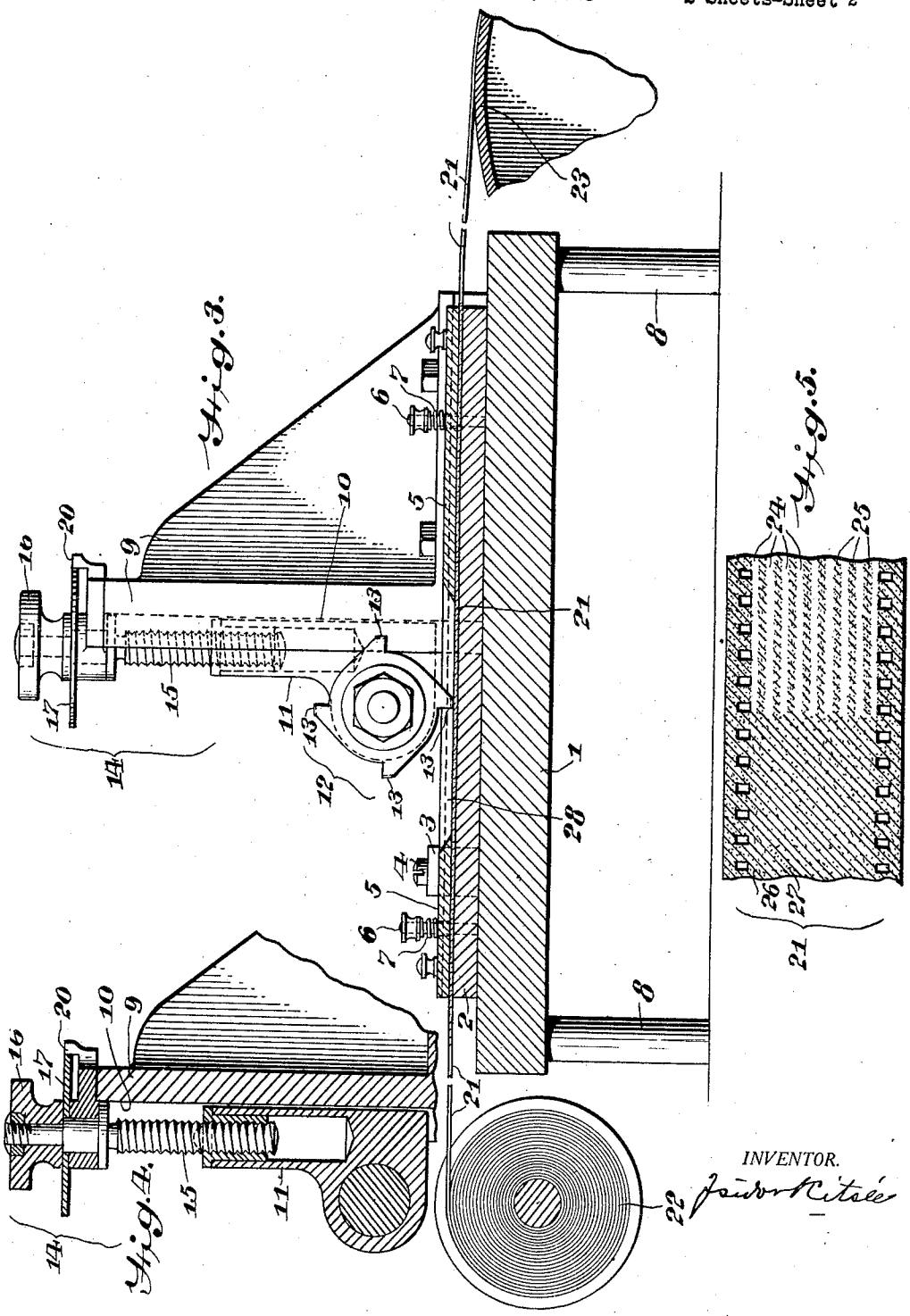
Isidor Kitsee

Dec. 4, 1923. 1,476,206

I. KITSEE

APPARATUS FOR RULING PHOTOGRAPHIC FILMS

Filed July 26, 1921 2 Sheets-Sheet 2



Patented Dec. 4, 1923. 1,476,206

UNITED STATES PATENT OFFICE.

ISIDOR KITSEE, OF PHILADELPHIA, PENNSYLVANIA.

APPARATUS FOR RULING PHOTOGRAPHIC FILMS.

Application filed July 26, 1921. Serial No. 487,633.

To all whom it may concern:

Be it known that I, ISIDOR KITSEE, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for Ruling Photographic Films, of which the following is a specification.

My invention relates to an improvement in apparatus for ruling photographic films.

The accompanying drawing illustrates a device with the aid of which I have produced integral polychromatic screens on moving picture films of different lengths. Some of the films are perforated before the production of the integral screen and on some of the films I produce integral screens without first perforating the film.

In the drawing Fig. 1 is a top plan view of the device, with part of film inserted therein. Fig. 2 is a transverse vertical section taken on line 2—2 of Fig. 1. Fig. 3 is a vertical longitudinal section taken on line 3—3 of Fig. 1. Fig. 4 is a vertical section taken on line 4—4 of Fig. 1, and Fig. 5 is a fragmentary plan view of part of the film.

In these drawings, 1 is the support or base on which the device used by me is mounted. 2 is the race-plate adapted to guide the film during the passage, so that the same may not deviate to right or left. This race-plate is held in position by the blocks 3—3 secured with the aid of the screws 4—4 to the support. 5 is the pressure plate, performing the office of keeping the film when passing through the race-plate in the desired flattened position. This pressure plate is secured to the race plate with the aid of the adjustable screws 6—6 in conjunction with the springs 7—7, to produce an exact adjustment of the pressure required. The support 1 is either fastened to a working bench directly or is provided, as shown in the drawing with legs 8—8. 9 is an angle plate secured to the base 1 and provided with a cutout part or machine slide 10. In this machine slide is positioned the carrier 11, supporting and carrying the cutter or knife 12. This cutter or knife is shown here as comprising four series of cutting knives 13, 13, 13, 13. Each series consists of a number of knife edges and the whole series is of a width, substantially equal to the width of a film from perforation to perforation. The width of each of the knives of each series corresponds to the width of the line it is desired to produce on the film. In some of the cutters made, each series consists of from 120 to 160 knives, spaced from each other substantially the width of each of the knife edges. The cutter is secured to the adjustable carrier 11. 14 are the adjustable means as an entirety for raising and lowering the carrier 11 and thereby the cutter 12. These adjustable means comprise here the micrometer screw 15, the means 16, here shown as a convential knob, to manipulate the screw, the dial 17 provided with the gradations 18 and the zero mark 19, having its counterpart on the stationary block 20.

In the drawing is also shown the film 21 in the process of being wound from the spool 22, carried through the race plate and in operative relation to one of the series of knives 13, and propelled by any suitable means 23 at whatever speed is found to be preferred under the circumstances.

In Fig. 5, 21 is part of a film as an entirety and of this film 24 represents the cut-out regions and 25 the intervening remaining areas. These unremoved areas are provided, as will hereinafter be more clearly explained with a tinted surface 26 and a coating 27.

It should be stated that the pressure plate 5 is provided with an aperture 28, so as to allow the edges of the normally stationary cutter to come into operative relation with the film proper.

The mode of operation in producing the integral screen is substantially as follows: Assume that the film upon which the screen is to be produced is about 200 feet in length (as most of the films are produced in lengths of 200 or 400 feet); and assume also that one (the reverse) surface of the film is, as usual, coated with gelatine. The first step is to tint the uncoated (obverse) surface with a given color, dissolved in a medium adapted to attack the celluloid of the film. In coating the film, I make use of a dye dissolved in alcohol and add thereto an equal quantity of ether. I carry the film through the dye-bath with the aid of a revolving drum and after the film has been passed through the dye-bath and has been dried, the tinted surface is covered with a temporary protective layer, such as gelatine, and after again drying it is wound around the spool 22.

The film is then threaded through the race plate of the device. All parts, including

the pressure plate, the cutter etc. are properly adjusted, so that when the film is drawn through the race plate the different knives of the cutter will cut into the film in such a manner, as to remove the protective coating and the tinted part of the surface. The film will then present a surface with clear lines in intaglio and protected tinted lines in relief.

With the aid of a drum or similar device the film is then drawn through a second dye-bath of a color different from the color of the first dye-bath, but of a nature adapted to attack the celluloid now laid bare.

I use for the second bath a dye dissolved in alcohol and add thereto about an equal quantity of ether. After drying, this second dye casting the temporary protective layers upon both the reverse and obverse surfaces of the film are removed with the aid of water, at a temperature slightly higher than normal.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a device of the class described, a race plate, a pressure plate provided with an aperture and adjustably secured to said race plate, and a stationary member having cutting edges projecting through the aperture of said pressure plate.

2. A device adapted to remove portions of the surface of a film, comprising a cutter, a stationary means to support each consecutive portion of a moving flexible film in exact predetermined relation with respect to said cutter, means operative to move a film with respect to said cutter and means to support said cutter and said first-named means adjustably with respect to each other to regulate the depth of said removed portions.

3. A device adapted to create spaced depressed or intaglio regions upon the surface of a film, comprising a cutter, means to move, and normally fixed means to operatively position, a film with respect to said cutter, and means to adjust the position of said cutter relative to said first means and to that portion of a film carried thereby in the immediate neighborhood of said cutter.

4. A device adapted to create spaced depressed or intaglio regions upon the surface of a flexible film, comprising a normally stationary cutter, means to move, and normally fixed means to operatively position, the film with respect to said cutter to cause said cutter to make spaced grooves in the surface of said film separated by uncut ridges, and means to adjust the position of said cutter relative to said first means and to that portion of a film carried thereby in the immediate neighborhood of said cutter.

5. An apparatus for cutting grooves in flexible photographic film, comprising a fixed cutting bed, means to move a film over said bed, a normally stationary cutter in operative relation with said bed, and micrometric means operative to adjust the depth of the grooves made by said cutter.

6. An apparatus for cutting grooves in photographic film, comprising a normally fixed cutter, means to move, and a race plate adapted to directly support, a film beneath and as said film progresses with respect to said cutter, and a pressure plate operative to maintain said film in intimate relation with respect to said race plate, and itself being fixedly positioned with respect to said race plate in the direction of movement of said film.

7. An apparatus for cutting grooves in photographic film, comprising a normally fixed cutter, a race plate adapted to directly support, and means to move, a film beneath said cutter, to cause said cutter to create grooves in the surface of said film, a pressure plate to maintain said film in substantially uniform relation with said race plate, said pressure plate being fixedly positioned with respect to said race plate in the direction of movement of said film, and means to yieldingly position transversely of, and to vary the pressure exerted by said pressure plate upon, said film.

8. In an apparatus for cutting a film, a stationary race plate adapted to support a moving film, an adjustable cutter normally fixed with respect to said plate to cut a groove in the surface of the film as said film moves with respect to said plate and cutter, a pressure plate operative to maintain said film in predetermined relationship with respect to said race plate, and means to vary the pressure of said pressure plate upon said race plate.

9. An apparatus for cutting a series of parallel grooves in the surface of a photographic film, comprising a normally fixed tool having a series of projections, a supporting member having a surface immediately beneath said tool and over which a film is adapted to be moved, and means to adjustably position said tool with respect to said supporting member.

10. An apparatus for producing a series of parallel alternately positioned grooves and ridges upon the surface of a photographic film, comprising a normally fixed tool having a series of spaced projections and intervening recesses operative to create respectively parallel grooves and intervening ridges in a film, a stationary race plate operative to support said film as it is engaged by said tool, means operative to move a film with respect to said tool, and means to adjust the position of said tool with respect to said race plate.

11. An apparatus for producing a series of parallel alternately positioned grooves and ridges upon the surface of a photographic

film, comprising a normally fixed tool having a series of spaced projections and intervening recesses operative to create repectively parallel grooves and intervening ridges in said film, a stationary race plate operative to support said film as it is engaged by said tool means to adjust the position of said tool with respect to said race plate. yielding means to maintain a film upon said race plate, means to vary the tension exerted by said last-named means upon the film upon said race plate, and means to move the film upon said plate and with respect to said tool.

In testimony whereof I affix my signature.

ISIDOR KITSEE.