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C. DE MOOS

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AUTOMATIC PHOTOGRAPHIC FILM SUPPLYING MACHINE

Filed Feb. 8, 1923

FIG. 1.

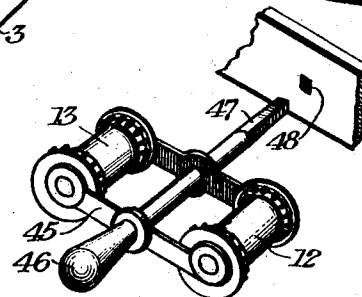
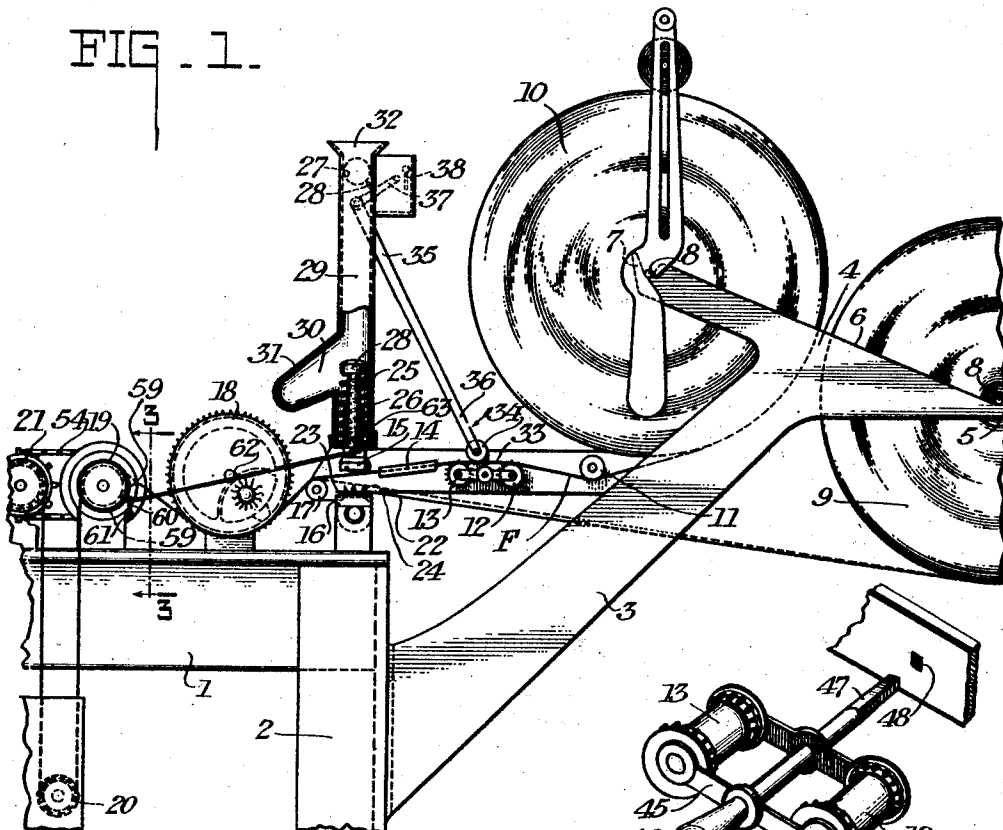


FIG. 2.

FIG. 3.

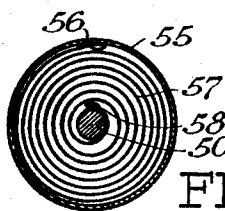
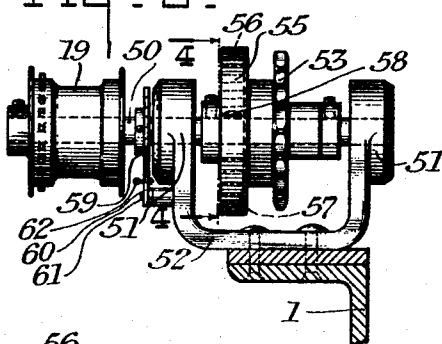
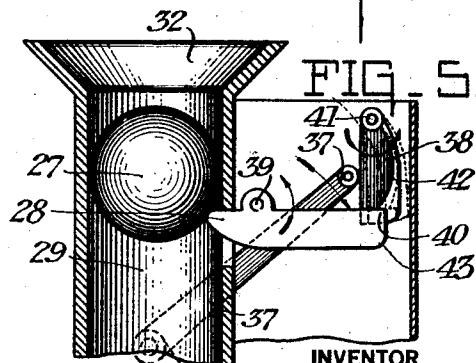


FIG. 4.

FIG. 5.



INVENTOR

Charles de Moos,

BY R. L. Stinchfield,

Attorney

ATTORNEY

UNITED STATES PATENT OFFICE.

CHARLES DE MOOS, OF FORT LEE, NEW JERSEY, ASSIGNOR TO EASTMAN KODAK COMPANY, OF ROCHESTER, NEW YORK, A CORPORATION OF NEW YORK.

AUTOMATIC PHOTOGRAPHIC FILM-SUPPLYING MACHINE.

Application filed February 8, 1923. Serial No. 617,834.

To all whom it may concern:

Be it known that I, CHARLES DE MOOS, a citizen of the United States of America, residing at Fort Lee, in the county of Bergen and State of New Jersey, have invented certain new and useful Improvements in Automatic Photographic Film-Supplying Machines, of which the following is a full, clear, and exact specification.

This invention relates to photography and more particularly to machines used for fastening the ends of lengths of photographic film bands preparatory to their various treatments, such as numbering, developing, fixing, washing, tinting and toning, etc. One object of this invention is to provide a film fastening mechanism which will function quickly without materially affecting the constant feeding of the film. Another object is to provide such a device which will function automatically without the immediate attention of an operator. Another object is to provide a film supply holder into which the film reels can be easily loaded; and to provide a holder having a first and second position for two supply reels, with means for rapidly transferring the first reel to the second position. Another object is to provide a suitably driven sprocket so that the film band will be fed to the machine at a constant speed, and at the same time will permit a momentary dwell of the film for the fastening operation. Still further objects will appear from the following specification, wherein the novel features are pointed out in the claims at the end thereof.

In the drawings, in which like reference characters denote like parts throughout:

Fig. 1 is a side elevation of a machine constructed in accordance with and illustrating one form of my invention (some parts being shown in simplified form for clearness);

Fig. 2 is a perspective of a part of my machine;

Fig. 3 is a section on the line 3—3 of Fig. 1;

Fig. 4 is a section on the line 4—4 of Fig. 3; and

Fig. 5 is a fragmentary section of the gravity operating device and the tripping mechanism therefor.

This machine is designed to hold several supplies of film and automatically joins the ends of two supply film bands as the first

one becomes exhausted. An operator then positions the film bands for the next uniting operation which will take place automatically as before.

The table or supporting member is carried at one end by an upright 2, which also carries a bracket 3 which terminates in a crosshead 4. There is a hook 5 at one end of the crosshead, from which there is a flat runway 6 leading to an upper hook 7. This support includes a second member identical to bracket 3 with crosshead 4, hooks 5 and 7, etc., which lies directly behind the first bracket being spaced therefrom a slightly greater width than that of the film band.

Hooks 5 and 7 support the film reels by shafts 8 which are engaged by the hooks. It should be noted that in the drawing each film "reel" consists only of a shaft 8, about which the film is coiled, but I can also use the well-known flanged reel when desirable by mounting the reel on a shaft 8. The supply reels refer to the coils of film which are supported upon the bracket 4, being indicated in Fig. 1 as a lower or reserve reel 9 mounted in hook 5 and an upper supply reel 10 mounted in the upper hook 7.

Film normally feeds from reel 10 in the following manner. The strip material F passes over guide roller 11, twin sprockets 12 and 13, through film guide 14, between the die 15 and anvil 16, over guide roller 17 about the toothed wheel 18, over the flexibly driven sprocket 19, over the floating roller 20, thence over the driven sprocket 21 and on through the machine at a constant speed.

When, however, the supply of film from reel 10 becomes exhausted, and the end, which I will call the final end to distinguish from the outer end of a film reel (the end on the outside of a roll), must be fastened to the outer end of the reserve roll 9. This is accomplished automatically as follows. The outer end 22 of the film from the reserve roll 9 is laid upon the anvil 16 with a metallic fastener 23 projecting through it having the sharp ends 24 projecting upwardly. The die 15, carried by a plunger 25, is normally held raised by a light spring 26, but may be caused to strike the fastener bending over the sharp ends thereof (thus uniting the film bands) by a gravity actuated striker 27. This striker, a ball, is normally held by a latch 28 which may be tripped by the film

band F from the supply reel, as will be hereinafter described. The striker 27 falls upon the end 28 of the die causing it to function, falling through the guideway 29.

5 After depressing die 15, the striker rolls down the exit passage 30 which obviously will admit the ball when the die is depressed. This permits the spring 26 to quickly raise die 15 so that the film uniting operation con-
10 sumes very little time, being almost instantaneous. The striker can then be removed through the opening 31, and repositioned through the mouth 32 of the guiding tube 29.

In order to trip the latch member 28 the following mechanism is used. The film band F passes over the twin sprockets 12 and 13, as before described, the reason for this being that the short length of film 33 is supported by the sprockets. On this
15 length of film the actuating roller 34 is held in the position in Fig. 1, wherein it maintains the bell crank lever 35 in an operative position. Roller 34 is supported on an end 36 of the lever 35 and the other end 37 is
20 adapted to strike the tripping member 38 when the film end reaches roller 12 permitting roller 34 to swing in the direction of the arrow, Fig. 1. The latch 28 is pivoted at 39 to the frame. The end 40 of this member contacts with the tripping member
25 38, which may swing about pivot 41. As part 37 strikes 38 it is swung in the direction of the arrow Fig. 5, permitting latch 28 to swing in the direction of the arrow, and allowing the striking member 27 to fall. The cam surface 42 contacting with part 43
30 when the parts are being set swings member 38 about its pivot so latch 28 may return to its set position. The weight of the tripping member 38 normally holds it in the position shown.

As will be seen from Fig. 2, sprockets 12 and 13 are carried by a frame 45 having an operating handle 46 which may be used for
45 removing or inserting the squared plug 47 into aperture 48, as the removal of these sprockets greatly facilitate positioning the film from the reserve to the supply position.

It is necessary to cause the film to momentarily pause just as the die 15 strikes the anvil 16 when the film ends are clipped together, this being accomplished by a
50 "flexibly" driven sprocket 19. As may be seen in Fig. 3, this is mounted on a shaft 50 supported by bearings 51 of bracket 52. A sprocket wheel 53 is mounted to turn freely on shaft 50, being moved constantly
55 by a chain 54. The sprocket moves a cup shaped member 55, to which is fastened an end 56 of a spring 57. The other end 58 is affixed to shaft 50, so that the shaft derives its entire movement through the spring, which is partially tensioned when driving.
60 A ratchet wheel 59 is affixed to the shaft and may be engaged by a pawl 60 to stop

the shaft momentarily, thus increasing the tension on spring 57. When released, the spring will drive shaft 50 faster than the normal driving speed for a moment, so that the only effect on the movement of the film
70 band is to vary, for the moment, the position of the floating roller 20, as sprocket 21 drives the film band from this variable supply constantly at an even speed into the machine.

Pawl 60 pivoted at 61 is actuated through the arm 62, which engages a pin 63 on the die 15, so that as the die approaches the anvil pawl 60 will momentarily engage
75 ratchet wheel 59, thus stopping the sprocket 19 until the film ends are clipped together. As the die 15 starts to rise the pawl is immediately released, thus permitting spring 57 to drive the shaft as above described.

The film is clipped together automatically and when an operator returns to the machine the film may be feeding from the reserve roll 9, in which case, in order to properly set the machine for the next automatic operation, he moves the roll from hook 5 up
80 incline 6 to hook 7. This does not in any way disturb the feeding of the film which continues during the operation. Having previously removed sprockets 12 and 13 by the handle 46, these are again positioned
85 with the film running over them, so that roller 34 is thus returned to its operative position and with it bell crank lever 35 is also moved to operative position, after returning the latch 28 to a position in which the striker 27 is held ready for the next operation. After the operator places a new reserve roll in place in hook 5 and threads the end of the film over the fastener on anvil 16, he may attend other machines.

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

1. A film supplying mechanism comprising, a reel of supply film, means for drawing film from said reel, a reel of reserve film, and means controlled by the supply film for connecting the outer end of said reserve film with the final end of said supply film.

2. A mechanism as in claim 1, in which the connecting means attaches a fastener to said ends of said films.

3. A mechanism as in claim 1 in which the connecting means clinches a pronged metal fastener in said ends of said films.

4. A film supplying mechanism comprising, a reel of supply film, a sprocket for drawing film from said reel, a driving element and a flexible member connecting the driving element and the sprocket, a reel of reserve film, means including the flexible member for permitting the sprocket to pause momentarily, whereby a dwell is produced in said drawing, and means for automati-
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cally connecting the outer end of said reserve film with the final end of said supply film during said dwell.

5 5. A film supplying mechanism comprising a reel of supply film, means for drawing film from said reel, a reel of reserve film, means for producing a dwell in said drawing, means for attaching together the outer end of said reserve film and the final end of said supply film during said dwell, 10 both of said means being controlled by the supply film.

15 6. A film supplying mechanism comprising a reel of supply film, means for conducting film from said reel, along a path, a reel of reserve film, a support adjacent said path for holding the outer end of said reserve film and a bendable fastening element attached to the film, and means co- 20 operating with said support for automatically connecting said outer end of the reserve film to the final end of said supply film by bending said fastening element over upon the supply film.

25 7. A film supplying mechanism comprising a reel of supply film, means for conducting film from said reel along a path, a reel of reserve film, a support adjacent said path for holding the outer end of said reserve film and a metallic clip, and means 30 cooperating with said support for auto-

atically completing a connection between said outer end of the reserve film and said final end of the supply film by clinching said clip. 35

8. A film supplying mechanism comprising a reel of supply film, means for conducting film from said reel along a path, a reel of reserve film, film fastening devices adjacent said path, a source of energy for 40 actuating said devices, and means controlled by the approach of the final end of said supply film for releasing energy from said source to actuate said devices to fasten said final end of the supply film to the outer end 45 of the reserve film.

9. A film supplying mechanism comprising a reel of supply film, means for conducting film from said reel along a path, a reel of supply film, film fastening devices 50 in operative position with respect to said path, the outer end of said reserve film and a fastening element being supported in said devices, and means controlled by the approach of the final end of said supply film 55 for actuating said devices to apply said element in fastening relation to said final end of the supply film and said outer end of said reserve film.

Signed at Astoria, L. I., N. Y., this 2nd 60 day of February 1923.

CHARLES DE MOOS.