United States Patent

Pammer et al.

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[54] STRIP-HANDLING ARRANGEMENT

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[30] **Foreign Application Priority Data**

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[52] **U.S. Cl.** **242/192**, 242/197

[51] **Int. Cl.** **G03b 1/58**, G11b 15/66

[58] **Field of Search** 242/192, 195, 201, 209, 197; 352/157, 158

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[57] **ABSTRACT**

A coil holder is detachably mounted in a frame and holds a coil of strip having a leading end on the periphery of said coil. A belt drive comprises a first pulley, which is rotatably mounted in said frame on a stationary axis, a first coil-engaging element including a second pulley and mounted in said frame for movement between an inoperative position, in which said first coil-engaging element is clear of said coil holder and coil, and an operative position, in which said second pulley bears on the periphery of said coil, and a belt trained around both said pulleys and having a forward course extending from said second pulley. Drive means are operable to drive said first pulley to move said forward course of said belt away from said second pulley to rotate said coil in a strip-unwinding sense when said first coil-engaging element is in its said operative position, whereby said leading end of said strip is moved in a predetermined direction of travel. A stripper constitutes a second coil-engaging element and is mounted in said frame for movement between an inoperative position, in which said stripper is clear of said coil holder and coil, and an operative position, in which said stripper engages the periphery of said coil at a point which succeeds said second pulley in said direction of travel when said first coil-engaging element is in its said operative position, said stripper and said forward course of said belt defining between them a passage through which said strip is movable in said direction of travel away from said coil. A locking device is mounted in said frame for movement between an inoperative position and an operative position, in which it engages at least one of said coil-engaging elements and holds it against moving to its said operative position.

3 Claims, 3 Drawing Figures

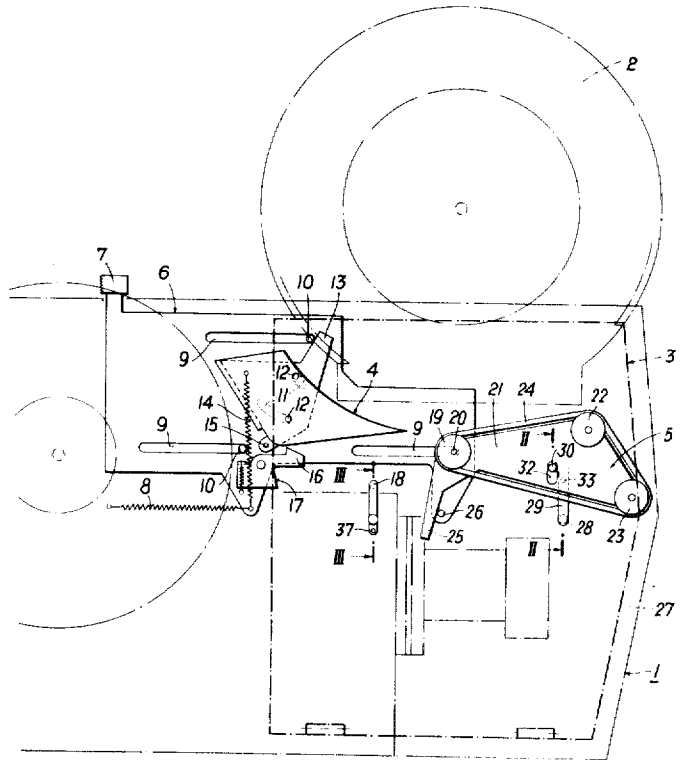
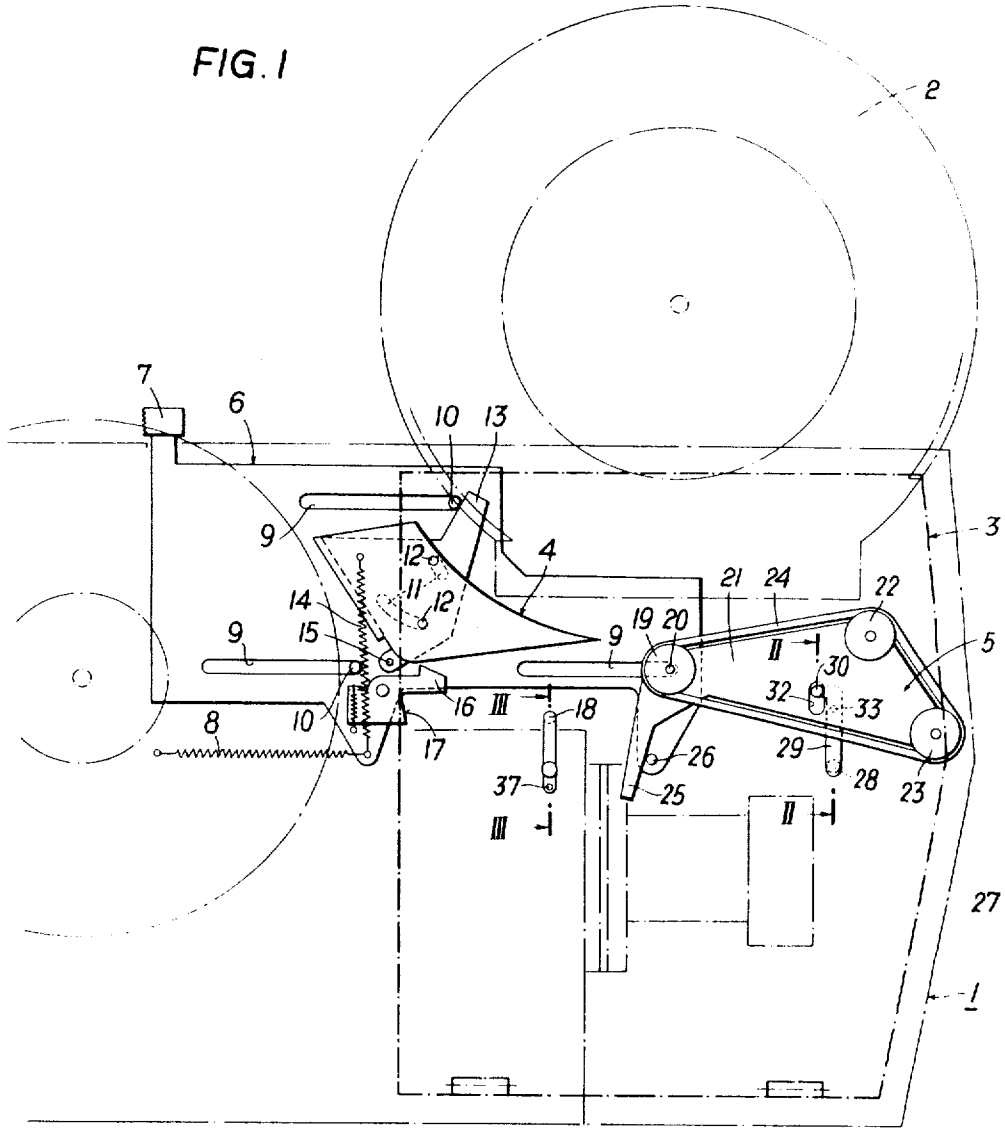


FIG. 1



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FIG. 2

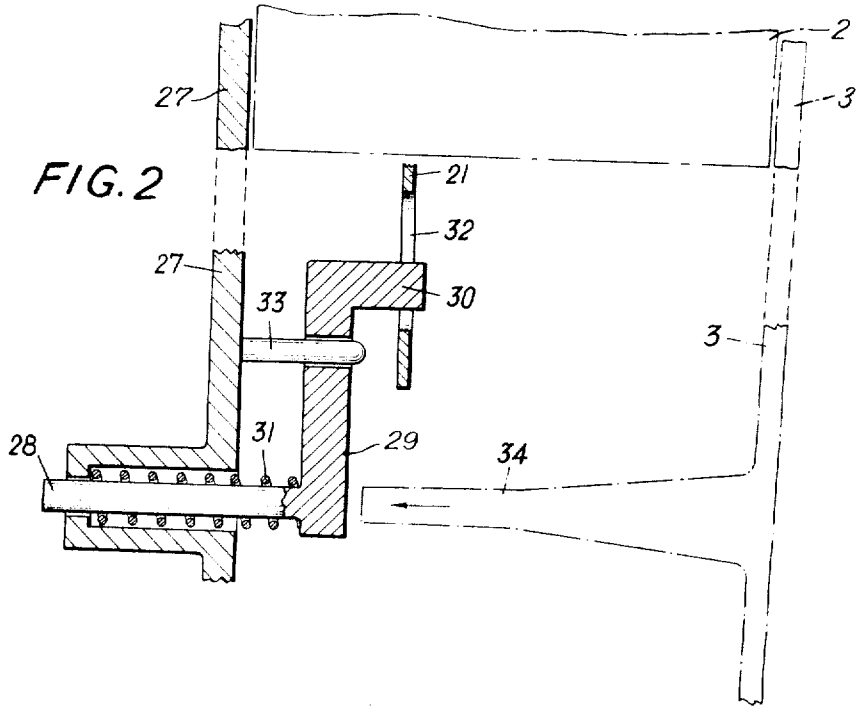
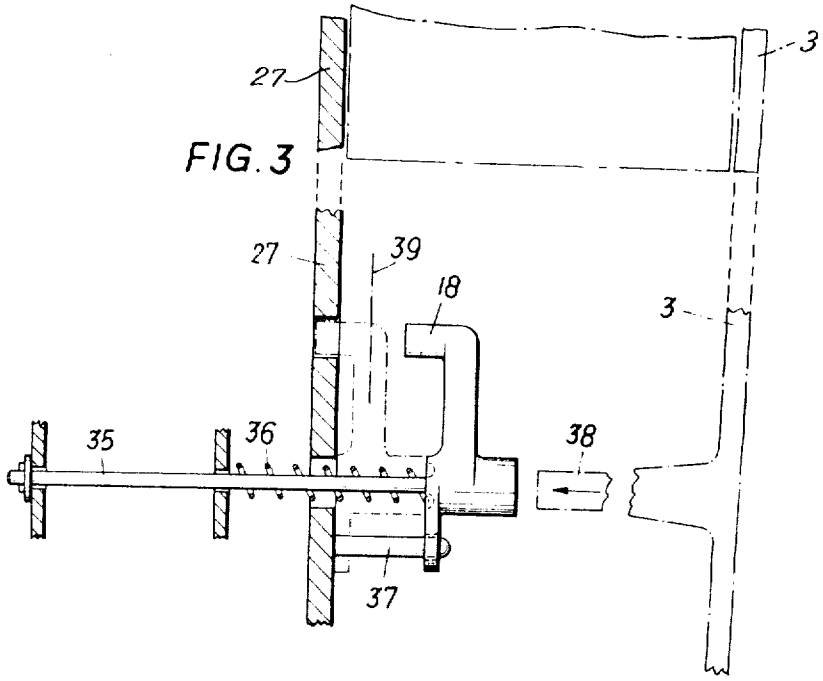


FIG. 3



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STRIP-HANDLING ARRANGEMENT

This invention relates to a strip-handling arrangement for removing a strip from a coil, which is preferably disposed in a cartridge, especially a motion picture camera or reproducing appliance. The arrangement comprises a stripper, which is mounted on the appliance and preferably resiliently engages the periphery of the coil to remove the leading end of the strip therefrom and a strip-feeding device comprising a belt drive, which comprises at least two pulleys including a first pulley mounted on a stationary axis and serving to drive the belt, and a friction pulley for removing the leading end of the strip, which friction pulley engages the periphery of the coil immediately before the stripper, in the direction of movement of the strip, and moves the strip in its direction of travel. The stripper and that course of the belt which moves away from the friction pulley form a passage for the travel of the strip. When the arrangement is used with cartridges, the leading end of the strip is guided to the feeding device by guides, which are mounted on the cartridge and are concentric with the coil of film. The strip is then engaged by the feeding device and caused to travel between the stripper and the departing course of the belt. If the arrangement is used with reels, no guides which concentrically surround the coil are provided so that the engagement of the feeding device with the leading end of the film is not ensured. For this reason, the leading end of the film wound on a reel is usually threaded by hand into the passage defined by the stripper and the belt drive. During the threading operation, the belt drive and the stripper are in extended position between the flanges of the reel so that the access to the above-mentioned passage is relatively difficult. Because the reels carrying a film or other strip and used without a cartridge have much larger tolerances and normally have apertured flanges, the feeding device and the stripper may engage one of the flanges of the reel and may even be damaged thereby.

It is an object of the invention to avoid these disadvantages of the known arrangements. This object is accomplished according to the invention by the provision of a locking device, which in its locking position cooperates with the feeding device and/or with the stripper and prevents a movement of the feeding device and/or the stripper to its operative position. The locking device may be controlled by hand by a change-over means by which the appliance can be changed over from the operation with cartridges to the operation with reels.

In a preferred embodiment of the invention, the locking device is operated automatically in response to the loading of the appliance with a cartridge or with a reel. Sensing means are preferably provided which in response to the absence of a cartridge move the locking device to its locking position. The sensing means may be structurally combined with locating means for locating the cartridge. Such sensing means used for other purposes have been disclosed in the Austrian Patent specifications 277,767 and 279,364. In appliances in which the cartridges or reels are disposed in a chamber which is closed by a cover, preferably a hinged cover, another embodiment of the invention may be used, in which the locking device is controlled by the cover to be inoperative when and only when the cover is closed so that the feeding means and/or the stripper are then movable to their operative positions but are locked in a position retracted from the coil when the cover is open.

Further features of the invention will become apparent from the following description of an embodiment shown by way of example on the drawings, in which

FIG. 1 is a diagrammatic view showing a substandard film projector for selectively using cartridges and reels.

FIG. 2 is an enlarged sectional view taken on line II—II in FIG. 1.

FIG. 3 is an enlarged sectional view taken on line III—III in FIG. 1.

A projector 1 is provided with a surface, not shown, which is engageable by film supply cartridges 2 in different sizes. The cartridge is located at the projector 1 in a predetermined

orientation by guide means, not shown, against which the cartridge is forced by a pressure cover 3, which closes the cartridge-holding chamber and holds the cartridge in position. A threading-out device consisting of a stripper 4 and a roller assembly 5 is provided for removing the leading end of a film which is contained in the form of a coil in the cartridge. The threading-out device is operable by a slider 6, which is movable by hand by a slidable knob 7 to the right in FIG. 1 against the action of a spring 8. The slider 6 is guided by means of pins 10 engaged with guide slots 9.

That limb of the U-shaped stripper 4 which faces the slider 6 is formed with cam slots 11, through which pins 12 extend. The stripper 4 comprises also an extension 13, which under the action of a spring 14 bears on the right upper one of the pins 10 for guiding the slider. Another extension is provided with a detent pin 15. The slider 6 is provided at its lower end with a pawl 16.

Upon a displacement of the slider 6 to the right from its position of rest, the spring 14 imparts to the stripper 4 a pivotal movement until the detent pin 15 engages the pawl 16. The stripper 4 will remain in this position when the slider 6 is displaced further. An engaging surface 17 of the pawl 16 finally engages a stop 18 so that the pawl 16 is disengaged. Under the action of the spring 14, the stripper 4 is then displaced until its leading end engages a coil of film contained in a cartridge 2.

The pulley assembly 5 shown in FIG. 1 comprises a driving pulley 19, which is secured to a driving shaft 20. The driving shaft 20 extends through one of the slots 9 of the slider 6 and thus serves as one of the guide pins 10. Additional pulleys 22 and 23 are mounted on a plate 21, which is pivoted on the drive shaft 20. A common belt 24 is trained around all pulleys 19, 22, 23.

As soon as the stripper has reached its operative position, the means for driving the shaft 20 may be started. This may preferably be accomplished in that the slider 6 is moved slightly further to the right to operate a clutch or other means for driving the shaft 20. The rotation of the shaft 20 imparts a pivotal movement to the plate 21 in the counterclockwise sense in FIG. 1 in dependence on the torque so that the plate 21 also engages the coil of film. Hence, the arrangement is such that there is a passage of uniform width regardless of the diameter of the coil, the stripper 4 will enter the cartridge before the pulley assembly 5, and a relatively small slot in the cartridge 2 is sufficient to permit of the movement of the stripper 4 into the cartridge.

When the film has been threaded out of the cartridge, the pulley assembly 5 generally returns by gravity to its initial position. If it fails to do so, for any reason whatever, the plate 21 may have an extension 25, to which a pivotal movement is imparted by a stop 26 of the slider 6 to move the plate 21 to its initial position, shown in FIG. 1. The stripper also returns to its position of rest, shown in FIG. 1, as soon as the guide pin 10 re-engages the extension 13 of the stripper 4. To prevent a movement of the feeding means 5 and the stripper 4 to their extended position when a reel is used in the appliance, a locking device is provided which is automatically controlled by the pressure cover 3. The cover 3 simultaneously forms a cartridge-sensing means for the cartridge 2. The operative connection of the sensing means 3 with the locking device is effected over the parts 34 and 38, respectively, as explained hereinbelow. The locking device comprises a pin 28, which is longitudinally slidably guided in the housing 27 of the projector 1 and which carries an angled arm 29 (see particularly FIG. 2). A spring 31 urges the locking member formed by the pin 28 and the arm 29 to its locking position, in which an extension 30 of the locking member extends into a slot 32 of the plate 21 of the feeding device 5. A stationary pin 33 extends through the arm 29 to hold the latter against rotation. The cover 3 carries on its inside an extension 34, which cooperates with the arm 29 and when the cover is in closed position moves the same to its left-hand end position, in which the extension 30 is clear of the slot 32 of the plate 21. Hence, the

feeding device 5 is moved into the cartridge as the cover 3 is closed whereas the feeding device 5 is locked in its position of rest when the cover is open.

Contrary to solutions which have been proposed hereinbefore, the stop 18 for the pawl 16 of the stripper is not stationary but secured to a post 35, which is longitudinally slidably mounted in the projector. A spring 36 urges the stop 18 to its position shown in solid lines in FIG. 3. A stationary pin 37 holds the stop 18 against rotation. Another pin 38 of the cover is in register with the stop 18 and moves the latter to its left-hand end position as the cover 3 is closed. The stop 18 is thus moved into the range of the pawl 16, which has a center plane that is indicated at 39 in FIG. 3. As long as the cover 3 of the appliance is open, a displacement of the slider 6 to the right will initially impart to the stripper 4 a pivotal movement through a small angle until the detent pin 15 snaps into the pawl 16. Because that pawl is disengaged, the stripper will remain in that position and will not be engaged with the coil of film. When the cover 3 has been closed, a displacement of the slider 6 will move the pawl 16 into engagement with the stop 18 so that the stripper 4 will be released and now moved into engagement with the coil of film under the action of the spring 14. In a modification of the feature described last, the stop 18 may be mounted directly on the cover 3.

The invention is not restricted to the embodiment shown by way of example. For instance, a lock may be provided for the slider 6 and may be disabled as the cover 3 is closed. Besides, the locking device for the feeding device 5 and/or the stripper 4 may be controlled by feelers, which are operated by the cartridge 2 and are arranged to move the locking device to its locking position when a reel is used. Finally, the locking device for the stripper and/or the feeding means may be strictly manually controlled.

What is claimed is:

1. A strip-handling arrangement, comprising

a frame,

a coil holder, which is detachably mounted in said frame and holds a coil of strip having a leading end on the periphery of said coil,

a belt drive comprising a first pulley, which is rotatably mounted in said frame on a stationary axis, a first coil-engaging element including a second pulley and mounted in said frame for movement between an inoperative position, in which said first coil-engaging element is clear of said coil holder and coil, and an operative position, in which said pulley bears on the periphery of said coil, and a belt trained around both said pulleys and having a forward course extending from said second pulley,

drive means operable to drive said first pulley to move said forward course of said belt away from said second pulley to rotate said coil in a strip-unwinding sense when said first coil-engaging element is in its said operative position, whereby said leading end of said strip is moved in a predetermined direction of travel,

a stripper constituting a second coil-engaging element and mounted in said frame for movement between an inoperative position, in which said stripper is clear of said coil holder and coil, and an operative position, in which said stripper engages the periphery of said coil at a point which succeeds said second pulley in said direction of travel when said first coil-engaging element is in said operative position, said stripper and said forward course of said belt defining between them a passage through which said strip is movable in said direction of travel away from said coil,

a locking device which is mounted in said frame for movement between an inoperative position and an operative position, in which it engages at least one of said coil-engaging elements and keeps it from said operative position,

said coil holder consists of a cartridge, and cartridge-sensing means engaging said cartridge and operatively connectable to said locking device and arranged to keep said locking device from said operative position when said cartridge is in position and to move said locking device to said operative position when said cartridge is removed from said frame.

2. A strip-handling arrangement, comprising

a frame,

a coil holder, which is detachably mounted in said frame and holds a coil of strip having a leading end on the periphery of said coil,

a belt drive comprising a first pulley, which is rotatably mounted in said frame on a stationary axis, a first coil-engaging element including a second pulley and mounted in said frame for movement between an inoperative position, in which said first coil-engaging element is clear of said coil holder and coil, and an operative position, in which said pulley bears on the periphery of said coil, and a belt trained around both said pulleys and having a forward course extending from said second pulley,

drive means operable to drive said first pulley to move said forward course of said belt away from said second pulley to rotate said coil in a strip-unwinding sense when said first coil-engaging element is in its said operative position, whereby said leading end of said strip is moved in a predetermined direction of travel,

a stripper constituting a second coil-engaging element and mounted in said frame for movement between an inoperative position, in which said stripper is clear of said coil holder and coil, and an operative position, in which said stripper engages the periphery of said coil at a point which succeeds said second pulley in said direction of travel when said first coil-engaging element is in said operative position, said stripper and said forward course of said belt defining between them a passage through which said strip is movable in said direction of travel away from said coil,

a locking device which is mounted in said frame for movement between an inoperative position and an operative position, in which it engages at least one of said coil-engaging elements and keeps it from said operative position,

said coil holder consists of a cartridge,

said frame defines a cartridge-holding chamber,

a cover is provided, which is adapted to assume relative to said frame a closing position, in which said cover closes said cartridge-holding chamber, and

said cover is arranged to keep said locking device from said operative position when said cover is in said closing position.

3. A strip-handling arrangement, comprising

a frame,

a coil holder, which is detachably mounted in said frame and holds a coil of strip having a leading end on the periphery of said coil,

a belt drive comprising a first pulley, which is rotatably mounted in said frame on a stationary axis, a first coil-engaging element including a second pulley and mounted in said frame for movement between an inoperative position, in which said first coil-engaging element is clear of said coil holder and coil, and an operative position, in which said pulley bears on the periphery of said coil, and a belt trained around both said pulleys and having a forward course extending from said second pulley,

drive means operable to drive said first pulley to move said forward course of said belt away from said second pulley to rotate said coil in a strip-unwinding sense when said first coil-engaging element is in its said operative position, whereby said leading end of said strip is moved in a predetermined direction of travel,

a stripper constituting a second coil-engaging element and mounted in said frame for movement between an inoperative position, in which said stripper is clear of said coil holder and coil, and an operative position, in which said stripper engages the periphery of said coil at a point which succeeds said second pulley in said direction of travel when said first coil-engaging element is in said

operative position, said stripper and said forward course of said belt defining between them a passage through which said strip is movable in said direction of travel away from said coil,

a locking device which is mounted in said frame for movement between an inoperative position and an operative position,

said locking device having means for locking both said coil-engaging elements and for keeping the latter out of their operative positions when said locking device is in its operative position.

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