July 21, 1936. V. C. DE YBARRONDO 2,048,182

BLOCK SYSTEM DEVELOPING MACHINE

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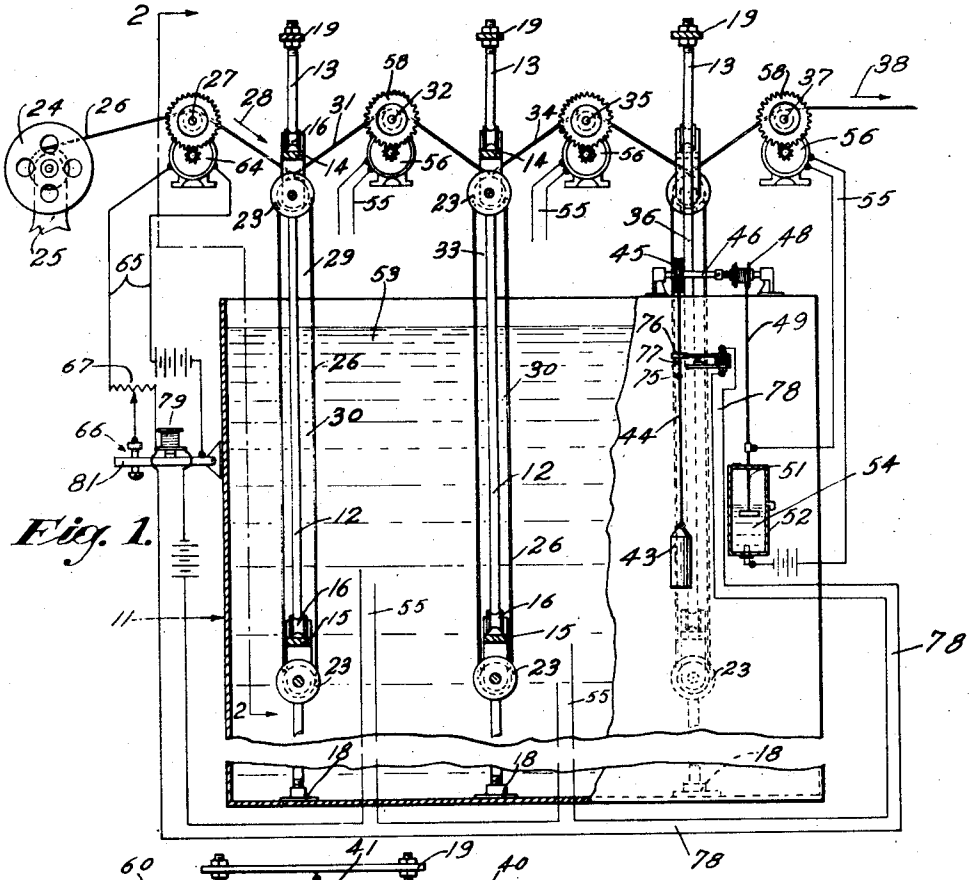


Fig. 1.

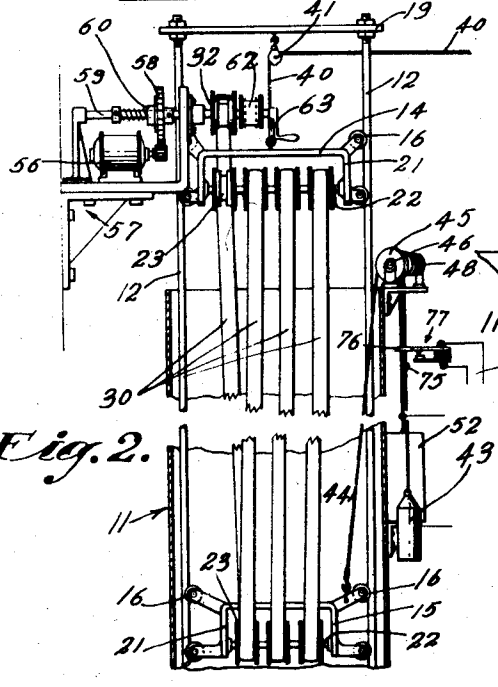


Fig. 2.

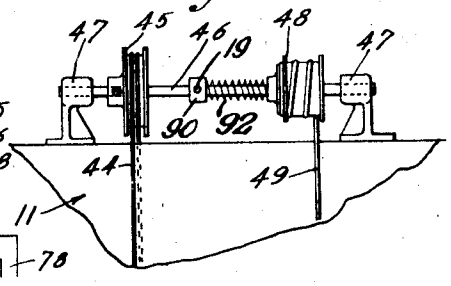


Fig. 3.

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BLOCK SYSTEM DEVELOPING MACHINE

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29 Claims. (Cl. 271—2.3)

My invention relates to film handling apparatus which may be employed to carry film through the various processes employed in the production of completed positive film.

In the motion picture industry a film in the form of a ribbon is employed, and during the production of the finished motion picture film it must be carried through vats containing developing the washing solutions and through drying chambers. In order to reduce operating costs to a minimum, much attention has been lately directed to machines for continuously handling the film so as to carry such film through the various steps or processes to which it must be subjected, with a minimum handling of the film, and machines have been developed which will carry a film continuously through various steps of a process by means of sprockets or similar devices; but such machines are found to have very marked disadvantages, among which are loss of valuable film and loss of time resulting from the breaking of the film within the automatic, continuously operating handling equipment.

It is an object of my invention to provide a film handling device having parts so relatively movable that the stress placed upon a film carried therethrough cannot exceed a predetermined maximum.

A further object of the invention is to provide handling equipment which will automatically compensate in its operation for the variation in length of a strip of film due to contraction and elongation.

A further object of the invention is to provide a device which will automatically shut down should breakage of the film occur at any place within the film handling device, and within which the film will not pile up and likewise will not be injured, thereby making it possible to save practically all of the film by making a splice where the break occurs and without necessity of removing adjacent portions of film which have become injured in the machine as a direct result of the film breaking.

A further object of the invention is to provide a film handling device which is extremely simple to operate and which may be operated by a single attendant.

Further objects and advantages of the invention will be made evident throughout the following part of the specification.

Referring to the drawing which is for illustrative purposes only,

Fig. 1 is a partly sectioned diagrammatic elevational view showing in simple manner the essential features of my invention.

Fig. 2 is a section on a plane represented by the line 2—2 of Fig. 1.

Fig. 3 is a fragmentary enlarged detail showing the shaft and pulley construction of the automatic controlling mechanism.

This film handling apparatus is adapted for the carrying of continuous strips of film or continuous strips of other materials through containers, treatment chambers, etc., wherein one or more steps of the process or treatment are performed on the strips. For the purpose of simplicity in disclosing the invention, I show my improved film handling apparatus in conjunction with a vat or tank 11 having a liquid therein through which a strip of film is to be carried, such liquid being a developing compound, fixing compound, washing compound, or film coating solution, as may be required in the carrying out of a film treating process. Mounted in the vat 11 are a plurality of slide members 12 each consisting of a pair of vertical bars 13, these bars serving as slides or guides for upper and lower blocks 14 and 15 which may be preferably equipped with rollers 16 to minimize friction in the engagement of the blocks 14 and 15 with the slide members 12. The lower ends of the vertical rods or bars 13 may be secured by means of base plates 18, and the upper ends of the pairs of bars 13 may be tied together by a cross bar 19.

The term "blocks" is employed with reference to the members 14 and 15 to indicate a movable member or frame having a plurality of rollers or pulleys mounted therein. Therefore, each of the blocks 14 and 15 consists of a frame member 21 having rollers 16 mounted thereon and a lateral shaft 22 carrying freely rotatable flanged rollers 23, the flanges of the rollers being intended for the purpose of guiding the film as it passes over the rollers.

From a film spool 24 carried by a bracket 25, a film 26 is conducted over a propelling means consisting of a pulley 27, this film being from thence carried, as indicated by an arrow 28, to the first film handling unit 29 consisting of the first cooperating pair of blocks 14 and 15, the film 26 being carried in consecutive loops 30 over the rollers of the upper and lower blocks 14 and 15. From the unit 29 the film is carried, as indicated at 31, over a second or secondary propelling means consisting of a pulley 32 to a second film handling unit 33 in which the film is carried in the form of loops 30 over the upper and lower rollers 23 supported respectively by

the upper and lower blocks 14 and 15. The film 26 may be in this manner carried continuously to any number of succeeding film handling units which will cooperate to produce the valuable results set forth in the objects. Therefore, in accordance with the foregoing, the film may be directed from the unit 33, as indicated at 34, over a secondary propelling means or pulley 35 to a film handling unit 36 which is substantially identical to the units 29 and 33. From the film handling unit 36 the film is carried over a pulley 37 and, as indicated by an arrow 38, may be directed to any desired point of disposal.

As shown in Fig. 2, the upper blocks 14 are each adjustably supported in the slides 12 by cords 40 which extend over pulleys 41, it being possible to raise or lower the upper blocks 14 as desired. The lower blocks 15 are each counterbalanced or partly counterbalanced by a weight 43 which is connected to the block 15 by means of a cable or cord 44 extended over a pulley 45 rigidly mounted on a shaft 46 so that the shaft 46 will be caused to rotate with the pulley 45. As shown in Fig. 3, the shaft 46 may be mounted in bearing brackets 47 and has a drum 48 mounted thereon which carries a rope or cable 49, the cable 49 being wound on the drum 48 in an anticlockwise direction and extending down to and being connected to the movable electrode 51 of a liquid type variable resistor or rheostat 52.

In Fig. 1, I have shown the counterweight 43 and rheostat 52, with their associated parts, in connection with the final film handling unit 36, but it is to be understood that each film handling unit 29 and 33 is provided with similar apparatus.

When a film is to be started or initially looped through the film handling equipment, the upper and lower blocks 14 and 15 are raised in their respective slides 12 to positions above the level of liquid 53 in the vat 11, each lower block 15 being positioned adjacent to its cooperating upper block 14, making it possible for the attendant to readily thread the leading end of a film or a leader strip, over the rollers 23 and pulleys 27, 32, 35, and 37 in their proper consecutive order. It will be perceived that when a lower block 15 is raised, the cable 44 extending to the counterweight 43 will move so as to rotate the shaft 46 in right-hand or clockwise direction, thus causing the cable 49 to wind on the spool or drum 48 and lift the movable electrode 51 from the electrolyte 54 of the rheostat 52, thereby increasing to a maximum the resistance of the rheostat 52 and reducing to a minimum the strength of current which will flow through the motor circuits 55 which extend to secondary motors 56 by which the pulleys 32, 35, and 37 are driven. As shown in Fig. 2, each motor 56 is mounted on a bracket 57 in a position to drive a gear 58 carried by a shaft 59, this gear 58 being frictionally mounted on the shaft and being adapted to drive the shaft 59 through a friction power transmitting means or clutch, diagrammatically indicated at 60. The rightwardly or outwardly projecting end of each shaft 59 has a pulley 32, 35, or 37 mounted thereon and may also be provided with a sprocket 62 and may be adapted to be engaged by a handle such as indicated at 63. The primary or initial propelling pulley 27 is driven by a motor 64 energized through a circuit 65 adapted to be closed by a magnetic drop switch 66 and having a rheostat 67 therein for controlling the speed of the motor. The rheostat 67 is set for a normal or desired advance of the film 26.

As previously described, the film is initially wound on the units 29, 33, and 36 with the blocks 15 in raised position, with the result that when the circuits to the various motors 64 and 56 are closed, the motors 56 will be rotating at a relatively low speed, if at all, with the following result: The pulley 27 rotating at a normal rate of speed will feed the film in the direction of the arrow 28 to the first film handling unit 29 at a speed considerably greater than that at which the pulley 32 is pulling a film from the unit 29. The length of the film in the unit 29 will increase, thus permitting the lengths of the loops 30 to increase and the lower block 15 to move downwardly in the slide member 12 thereof, carrying the film into the liquid 53. As the lower block 15 approaches the position in which it is shown in Fig. 1, the rheostat associated therewith will be operated to lower the electrode 51 in or into the electrolyte 54 to turn on or increase the current delivered to the motor 56 which drives the secondary pulley 32, thereby increasing the speed at which the film is taken off at 31 from the handling unit 29, the block 15 of the unit 29 continuing to lower until the speed of the pulley 32 is sufficient to remove the film from the unit 29 as fast as the pulley 27 is delivering film thereto. At this time the length of film in the unit 29 will remain substantially constant, and the position of the lower block 15 of the unit 29 will remain substantially constant.

When the unit 29 has expanded due to the feeding of the film thereinto, as previously described, and its lower block 15 has been brought to a stationary position adjacent to the lower end of the vat 11, the motor 56 driving the pulley 32 will cause film to be fed into the second film handling unit 33, and this second film handling unit will expand by downward movement of its lower block 15 in a manner identical to that explained relative to the unit 29. When the unit 33 has become filled or expanded, the film will be carried through the units 29 and 33 into the unit 36 which in turn will expand in the manner previously described.

Each secondary motor 56 is controlled in speed in accordance with the size of the film handling unit lying adjacent thereto; therefore, all of the units 29, 33, and 36 are automatically kept at a desired condition of expansion, and it will be recognized that the handling equipment may be worked either forwardly or rearwardly.

Should the film break in any of the units 29, 33, or 36, the lower block 15 of the unit in which the break occurs will immediately drop from its normal position of operation, with the result of raising its associated counterweight 43 and carrying a body 75 upwardly against the upper leg 76 of a switch 77 forming part of a circuit 78 which extends to the holding magnet 79 of the drop-switch 66 which is adapted to close the power circuit of the motor 64. The breaking of the circuit 78 causes de-energization of the magnet 79 so that the drop arm 81 of the switch 66 will be thereby released so as to drop down and produce an open condition of the switch 66, thus immediately stopping the motor 64 so as to stop the feeding of the film in the direction of the arrow 28 into the first film handling unit 29 which will then shorten and raise its lower block 15, there being an accompanying operation of the rheostat connected with the motor 56 by which the pulley 32 is driven to shut off the current to the motor which drives the pulley 32. Each of the motors 56 will be shut down in this manner.

It is also intended in the practice of my inven-

tion to include a cut-out switch, such as indicated at 66, in each circuit or in the master power circuit from which power for driving the motors is obtained so that all of the drive motors will be substantially instantaneously shut down should breakage of the film occur in any of the film handling units.

This new film handling device has very marked advantages over the old types of automatic film handling equipment. The tension which may be exerted on any portion of the film is determined by the effective weight of each lower block 15, it being recognized that part of the weight of each block is counterbalanced by a counterbalance weight 43. The actual stress which may be placed on the film is therefore determined solely from the force applied to relatively separate the pair of upper and lower blocks of each film handling unit.

The rollers 23 are individually turnable so that the rotation of one roller does not control the rotation of another; therefore, it is impossible for contraction of the film at any point throughout its length to produce a breaking strain, as such contraction will be immediately compensated for by the turning of the rollers 23 and movement of the lower blocks 15. Breakage of the film does not result in a loss of film due to piling up of the film within the machine for the reason that any breakage immediately produces a stopping of the equipment. The film may be very easily threaded through the machine with the blocks in raised position, or a leader may be threaded into the machine while the blocks are in raised position, these blocks being lowered as the machine is entirely threaded.

If desired, the upper block may be lowered to entirely submerge the loops 30 carried thereby in the liquid of the vat 11. Each unit 29, 33, or 36 is in the form of a block and tackle through which a strand is being continuously moved. Both ends of the strand, represented by the film 26, extend to a motor whereby to accomplish a desired movement of the strand through the blocks or in and out of the blocks.

The rheostat 52 may be designed to shut off completely or nearly completely, as may be desired in the practice of the invention. In Fig. 1, I have shown the electrode 51 adapted to be raised from the electrolyte 54 so as to completely open the circuit 55 to a corresponding secondary motor 56, but is will be recognized that the rheostat may be so designed that it will operate to reduce the speed of the motor 56 to a very small rate.

The drum 48 is resiliently and adjustably mounted on the shaft 46 by means of a block 90 which is secured on the shaft by means of a set screw 91. To cause the drum 48 to turn with the block 90, a connecting means in the form of a spring 92 is employed, this spring having its ends connected respectively to the drum 48 and the member 90. To change the position of the electrode 51 so that it will engage the electrolyte 54 when the movable member 15 is in a different position from the operating position shown in the drawing, the set screw 91 may be released so as to permit rotation of the drum 48 relative to the shaft whereby to wind or unwind the cable 49 while the member 45 and the cable 44 remain stationary.

Although I have herein shown and described a simple and practical form of my invention, it is recognized that certain parts or elements thereof are representative of other parts, elements, or mechanisms which may be employed in substantially the same manner to accomplish substantially the same results; therefore, it is to be understood that the invention is not to be limited to the details disclosed herein but shall have the scope of the following claims.

I claim as my invention:

1. A film handling device of the character described, including: a pair of cooperating blocks; means for slidably supporting said blocks for co-relative movement, there being a force application tending to separate said blocks; a plurality of rollers on each block over which a film may be carried in loops; means for directing said film to a roller of said blocks; and means for taking said film from a roller of said blocks, said loops of film controlling the separation of said blocks by said force application.

2. A film handling device of the character described, including: a pair of cooperating blocks; means for slidably supporting said blocks for co-relative movement, there being a force application tending to separate said blocks; a plurality of rollers on each block over which a film may be carried in loops, said loops of film controlling the separation of said blocks; and propelling means engaging said film at a point adjacent to said blocks, said propelling means being controlled in accordance with the co-relative movement of said blocks.

3. A film handling device of the character described, including: a pair of cooperating blocks; means for slidably supporting said blocks for co-relative movement, there being a force application tending to separate said blocks; a plurality of rollers on each block over which a film may be carried in loops, said loops of film controlling the separation of said blocks; propelling means engaging said film at a point adjacent to said blocks; and means actuated in consequence of co-relative movement of said blocks for controlling said propelling means in a manner to preserve a predetermined separation of said blocks.

4. A film handling device of the character described, including: an upper block; a lower block; means for vertically slidably supporting said blocks for co-relative movement, there being a force application tending to separate said blocks; a plurality of rollers on each block over which a film may be carried in loops; means for directing said film to a roller of said blocks; and means for taking said film from a roller of said blocks, said loops of film controlling the separation of said blocks by said force application.

5. A film handling device of the character described, including: an upper block; a lower block; means for vertically slidably supporting said blocks for co-relative movement, there being a force application tending to separate said blocks; a plurality of rollers on each block over which a film may be carried in loops, said loops of film controlling the separation of said blocks; and propelling means engaging said film at a point adjacent to said blocks, said propelling means being controlled in accordance with the co-relative movement of said blocks.

6. A film handling device of the character described, including: an upper block; a lower block; means for vertically slidably supporting said blocks for co-relative movement, there being a force application tending to separate said blocks; a plurality of rollers on each block over which a film may be carried in loops, said loops of film controlling the separation of said blocks; propelling means engaging said film at a point adjacent to said blocks; and means actuated in conse-

quence of co-relative movement of said blocks for controlling said propelling means in a manner to preserve a predetermined separation of said blocks.

7. A film handling device of the character described, including: an upper block; a lower block; means for slidably supporting said blocks in vertical positions, there being a force application tending to move said lower block downwardly; means for securing said upper block in a desired stationary position; a plurality of rollers on each block over which a film may be carried in loops; means for directing said film to a roller of said blocks; and means for taking said film from a roller of said blocks, said loops of film controlling the separation of said blocks by said force application.

8. A film handling device of the character described, including: an upper block; a lower block; means for slidably supporting said blocks in vertical positions, there being a force application tending to move said lower block downwardly; means for securing said upper block in a desired stationary position; a plurality of rollers on each block over which a film may be carried in loops, said loops of film controlling the separation of said blocks; and propelling means engaging said film at a point adjacent to said blocks, said propelling means being controlled in accordance with the co-relative movement of said blocks.

9. A film handling device of the character described, including: an upper block; a lower block; means for slidably supporting said blocks in vertical positions, there being a force application tending to move said lower block downwardly; means for securing said upper block in a desired stationary position; a plurality of rollers on each block over which a film may be carried in loops, said loops of film controlling the separation of said blocks; propelling means engaging said film at a point adjacent to said blocks; and means actuated in consequence of co-relative movement of said blocks for controlling said propelling means in a manner to preserve a predetermined separation of said blocks.

10. A film handling device of the character described, including: a pair of cooperating blocks; means for slidably supporting said blocks for co-relative movement, there being a force application tending to separate said blocks; a plurality of rollers on each block over which a film may be carried in loops, said loops of film controlling the separation of said blocks; propelling means engaging said film at a point adjacent to said blocks, said propelling means being controlled in accordance with the co-relative movement of said blocks; and means for stopping said propelling means consequent upon the separation of said blocks in excess of a given dimension.

11. A film handling device of the character described, including: a pair of cooperating blocks; means for slidably supporting said blocks for co-relative movement, there being a force application tending to separate said blocks; a plurality of rollers on each block over which a film may be carried in loops, said loops of film controlling the separation of said blocks; propelling means engaging said film at a point adjacent to said blocks; means actuated in consequence of co-relative movement of said blocks for controlling said propelling means in a manner to preserve a predetermined separation of said blocks; and means for stopping said propelling means consequent upon the separation of said blocks in excess of a given dimension.

12. A film handling device of the character described, including: a plurality of slides; a pair of cooperating blocks slidably supported by each of said slides, there being a force application tending to separate said blocks; a plurality of rollers on each of said blocks over which a film may be carried in the form of loops, such film being conducted from one pair of cooperating blocks to another; film propelling devices engaging said film adjacent to said pairs of cooperating blocks; and means actuating in consequence of co-relative movement of said blocks for controlling the speed of said propelling devices so as to preserve a predetermined separation of said blocks.

13. A film handling device of the character described, including: a plurality of slides; a pair of cooperating blocks slidably supported by each of said slides, each pair of cooperating blocks consisting of an upper block and a lower block, there being a force application tending to separate said blocks; a plurality of rollers on each of said blocks over which a film may be carried in the form of loops, such film being conducted from one pair of cooperating blocks to another; film propelling devices engaging said film adjacent to said pairs of cooperating blocks; and means actuating in consequence of co-relative movement of said blocks for controlling the speed of said propelling devices so as to preserve a predetermined separation of said blocks.

14. A film handling device of the character described, including: a plurality of slides; a pair of cooperating blocks slidably supported by each of said slides, there being a force application tending to separate said blocks; a plurality of rollers on each of said blocks over which a film may be carried in the form of loops, such film being conducted from one pair of cooperating blocks to another; film propelling devices engaging said film adjacent to said pairs of cooperating blocks; means actuating in consequence of co-relative movement of said blocks for controlling the speed of said propelling devices so as to preserve a predetermined separation of said blocks; and auxiliary means actuated in response to relative movement of said cooperating pairs of blocks into predetermined positions of separation for stopping one of said propelling devices when said film breaks.

15. A film handling device of the character described, including: a plurality of slides; a pair of cooperating blocks slidably supported by each of said slides, there being a force application tending to separate said blocks; a plurality of rollers on each of said blocks over which a film may be carried in the form of loops, such film being conducted from one pair of cooperating blocks to another; film propelling devices engaging said film adjacent to said pairs of cooperating blocks; means actuating in consequence of co-relative movement of said blocks for controlling the speed of said propelling devices so as to preserve a predetermined separation of said blocks; and auxiliary means actuated in response to relative movement of said cooperating pairs of blocks into predetermined positions of separation for stopping the first of said propelling devices when said film breaks.

16. A film handling device of the character described, including: a plurality of slides; a pair of cooperating blocks slidably supported by each of said slides, there being a force application tending to separate said blocks; a plurality of rollers on each of said blocks over which a film may

be carried in the form of loops, such film being conducted from one pair of cooperating blocks to another; a primary propelling device for feeding said film to the first of said pairs of cooperating blocks; secondary film propelling device engaging said film intermediate each of said pairs of cooperating blocks; means actuating in consequence of relative movement of said blocks in said slides for controlling the speed of said secondary propelling devices so as to preserve a predetermined separation of said pairs of cooperating blocks; and auxiliary means for stopping said primary propelling means in event of breakage of said film.

17. A film handling device of the character described, including: walls forming a film treating zone; a plurality of expansible film receiving members in said film treating zone; a primary propelling device for feeding a film to the first of said members, said film being carried from one expansible member to another; secondary propelling devices engaging said film so as to feed same into succeeding of said expansible members; and means controlling the operation of said secondary propelling devices in a manner to maintain a desired expansion of said expansible members.

18. A film handling device of the character described including: a plurality of expansible film receiving members; film feeding means for feeding a film into the first of said film receiving members; a film motivating means for each of said film receiving members, for taking said film from said film receiving members, means controlled by the expansion of said expansible members for determining the speed of said motivating means so that the speed of said motivating means will increase when said film receiving members expand beyond a predetermined point and will decrease when said film receiving members contract within said predetermined point; and means for varying the predetermined points of expansion of said film receiving members.

19. A film handling device of the character described, including: a plurality of expansible film receiving members; film feeding means for feeding a film into the first of said film receiving members; a film motivating means for each of said film receiving members, for taking said film from said film receiving members; variable speed motors for driving said motivating means; and means controlled by the expansion of said expansible members for gradually increasing or decreasing the speed of said motors so that the speed of said motivating means will increase when said film receiving members expand beyond a predetermined point and will decrease when said film receiving members contract within said predetermined point.

20. A film handling device of the character described, including: a plurality of expansible film receiving members; film feeding means for feeding a film into the first of said film receiving members; a film motivating means for each of said film receiving members, for taking said film from said film receiving members; means controlled by the expansion of said expansible members for determining the speed of said motivating means so that the speed of said motivating means will increase in proportion to the movement of said film receiving members when said film receiving members expand beyond a predetermined point and will decrease when said film receiving members contract within said predetermined point; and means for varying the predetermined points of expansion of said film receiving members.

21. A film handling device of the character described, including: a plurality of expansible film receiving members; film feeding means for feeding a film into the first of said film receiving members; a film motivating means for each of said film receiving members, for taking said film from said film receiving members; and means controlled by the expansion of said expansible members for gradually increasing or decreasing the speed of said motivating means so that the speed of said motivating means will increase in proportion to the movement of said film receiving members when said film receiving members expand beyond a predetermined point and will decrease when said film receiving members contract within said predetermined point.

22. A film handling device of the character described, including: an expansible film receiving member having parts adapted to move into relatively expanded positions as a film is fed thereto; propelling devices for feeding said film to and taking said film from said expansible film receiving member at such speed that a desired condition of expansion of said expansible member is attained and preserved; and means for automatically stopping one of said propelling devices when said film breaks.

23. A film handling device of the character described, including: walls forming a space for a film treating fluid; an expansible film receiving member in said space having a part moving in accordance with the expansion of said expansible member; means for feeding a film to said expansible member at a prescribed rate of movement; removing means for taking film from said expansible member; members forming an electric circuit; electric current control means for said circuit connected to a movable part of said expansible member; and electrically operated drive means for said removing means, said electically operated drive means being included in said electric circuit and being operated in response to the amount of electric current passing through said electric circuit, as controlled by said electric circuit control means.

24. A motion picture film treating device of the character described, including: expanding means relatively movable for forming a loop of film; a motor; film moving means adapted to be driven by said motor; a pulley; a cable member extending from said expanding means and being connected to said pulley so as to produce rotation thereof as said expanding means contracts and expands in accordance with the length of the loop of film formed thereby; switch actuating means connected to said pulley so as to be moved in response to the rotation of said pulley; and a regulating switch electrically connected with said motor and operated by said switch actuating means whereby to control said motor so as to propel said film in such a manner that said expanding means will be maintained in a predetermined condition of expansion.

25. A motion picture film treating device of the character described, including: expanding means relatively movable for forming a loop of film; a motor; film moving means adapted to be driven by said motor; a pulley; a cable member extending from said expanding means and being connected to said pulley so as to produce rotation thereof as said expanding means contracts and expands in accordance with the length of the loop of film formed thereby; a drum se-

cured to said pulley and having a switch operating cable wound thereover; and a switch having a moving part connected to said switch operating cable, there being adjustment means for varying the position of said moving part relative to said pulley.

26. A motion picture film treating device of the character described, including: expanding means relatively movable for forming a loop of film; a motor; film moving means adapted to be driven by said motor; a pulley; cable extending over said pulley so as to rotate the same, the inner end of said cable being connected to said expanding means, and the outer end of said cable having a switch actuating part thereon; switch means having an operating element adapted to be engaged by said switch actuating part when such switch actuating part is raised above a predetermined position; switch actuating means connected to said pulley so as to be moved in response to the rotation of said pulley; and a regulating switch electrically connected with said motor and operated by said switch actuating means whereby to control said motor so as to propel said film in such a manner that said expanding means will be maintained in a predetermined condition of expansion.

27. A motion picture film treating device of the character described, including: expanding means relatively movable for forming a loop of film; a motor; film moving means adapted to be driven by said motor; a pulley; a cable extending over said pulley so as to rotate the same, the inner end of said cable being connected to said expanding means, and the outer end of said cable having a switch actuating part thereon; switch means having an operating element adapted to be engaged by said switch actuating part when such switch actuating part is raised above a predetermined position; a drum secured to said pulley and having a switch operating cable wound thereover; and a switch having a moving part connected to said switch operating cable, there being adjustment means for varying the position of said moving part relative to said pulley.

28. A film handling device of the character described, including: walls forming a film treating zone; an expansible film receiving member in said film treating zone adapted to form a loop of film and to expand and contract in accordance with the quantity of film therein; means for feeding a film to said receiving member at a speed determined in accordance with the treatment to be given said film; film take-off means for removing film from said receiving member; drive means for said take-off means; and control means connected to said receiving member and functioning to vary the speed of said drive means in accordance with the expansion and contraction of said receiving member so as to maintain a substantially constant expansion of said film receiving member.

29. A film handling device of the character described, including: walls forming a film treating zone; an expansible film receiving member in said film treating zone adapted to form a loop of film and to expand and contract in accordance with the quantity of film therein; means for feeding a film to said receiving member; take-off means for removing film from said receiving member; a mechanism for controlling the speed of one of said means in accordance with the treatment to be given said film while it is in said receiving member; and a control device connected to said receiving member so as to be operated thereby, said control device varying the speed of said other means in accordance with the expansion and contraction of said receiving member in a manner to maintain a substantially constant expansion of said receiving member.

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