May 20, 1958 D. R. BISHOP 2,835,177

SHEET-ARRESTING MECHANISM FOR PHOTOGRAPHIC APPARATUS

Filed Dec. 29, 1953 2 Sheets-Sheet 1

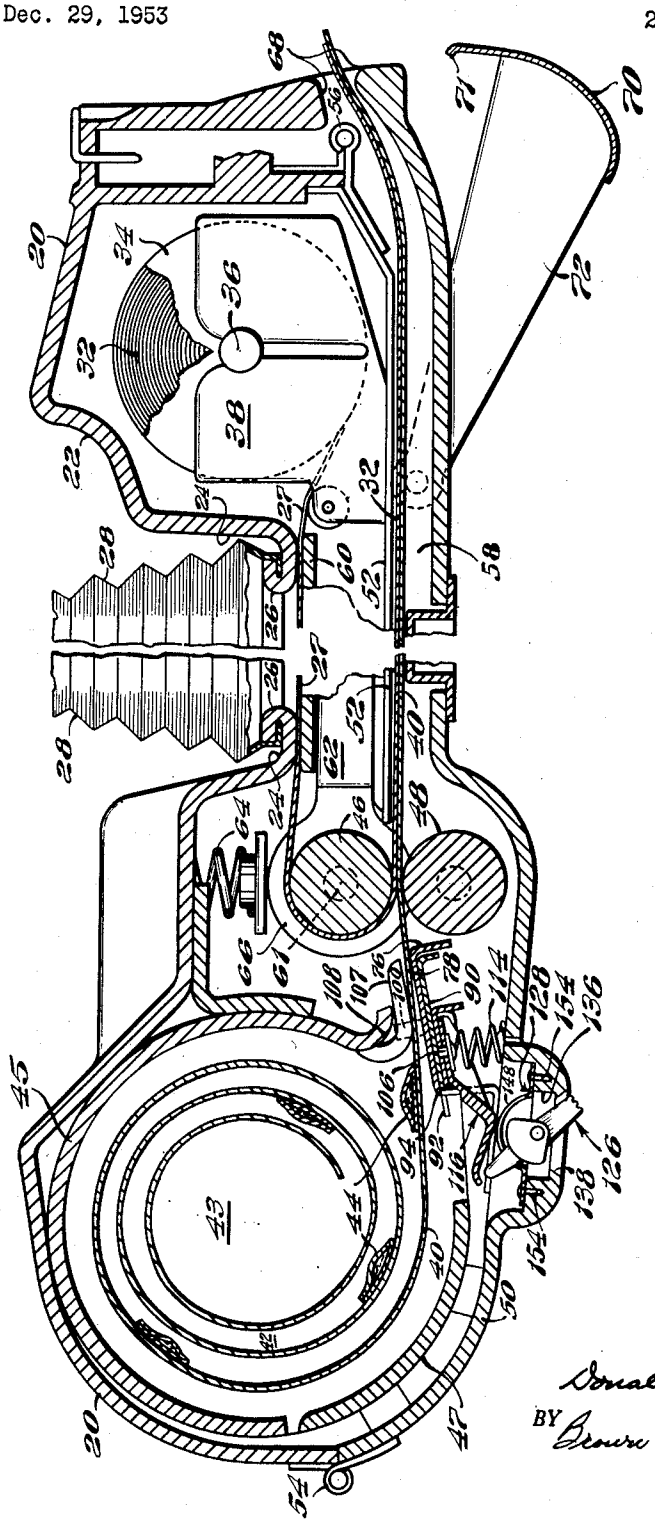


Fig. 1

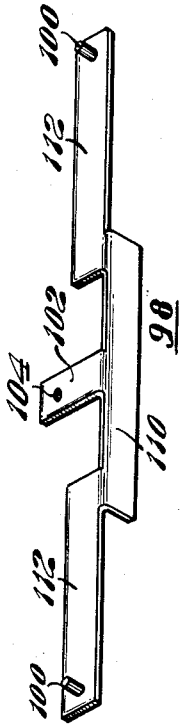


Fig. 2

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SHEET-ARRESTING MECHANISM FOR PHOTOGRAPHIC APPARATUS

Filed Dec. 29, 1953 2 Sheets-Sheet 2

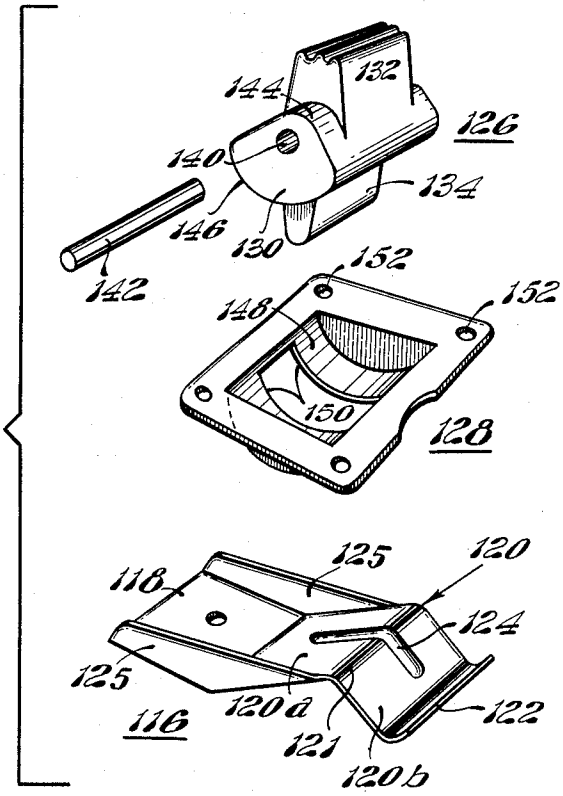


Fig. 4

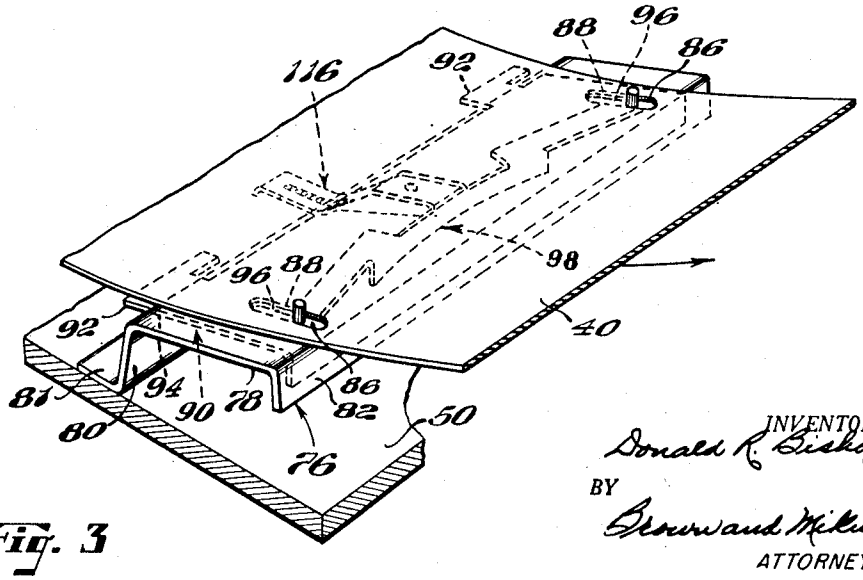


Fig. 3

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SHEET-ARRESTING MECHANISM FOR PHOTOGRAPHIC APPARATUS

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Application December 29, 1953, Serial No. 400,881

4 Claims. (Cl. 95—31)

This invention relates to novel release means for controlling the operation of sheet-arresting mechanism.

It has been proposed to provide, in apparatus thorugh which sheet material is advanced, mechanism for arresting the movement of the sheet material at predetermined intervals. The sheet-arresting mechanism includes at least one stop member adapted to engage successive, regularly spaced, engageable portions of the sheet material as the latter is advanced and an engageable portion thereof becomes aligned with the stop member. The stop member is mounted on resilient means so as to be movable in a plurality of directions and is normally urged into engagement with the sheet material and in a direction opposite the direction of movement of the latter. As the stop member becomes engaged by a portion of the sheet material, it is moved forward therewith against the bias of the resilient mounting means until its movement and that of the sheet material are arrested by means defining the limit of movement of the stop member. To permit continued predetermined advancement of the sheet material, the stop member is moved in a direction substantially normal to the direction of movement of the sheet material out of engagement with the engageable portion thereof. Upon withdrawal from engagement with the sheet material, the stop member moves under the bias of its mounting means in a direction opposite the direction of advancement of the sheet material. By virtue of this arrangement, only a momentary withdrawal of the stop member is required to permit its return to a position wherein it is adapted to engage the next successive engageable portion of the sheet material as it is advanced into alignment with the stop member. The release means may take the form of a push button or the like for pivoting the means on which the stop member is mounted. This type of manually operative release means, while being essentially satisfactory, permits the operator to hold the button in operative position and thereby hold the stop member from engagement with the sheet material while the latter is being advanced. When this occurs, the sheet material will continue to advance without being arrested when an engagement portion becomes aligned with a stop member.

It is accordingly an object of the present invention to provide, in combination with sheet-arresting mechanism having stop members adapted to engage portions of sheet material during its advancement, novel release means for momentarily withdrawing said stop members from engagement with said sheet material.

Another object of the present invention is to provide manually operative release means which are capable of effecting only a momentary withdrawal of said stop members from said sheet material.

The invention accordingly comprises the apparatus possessing the construction, combination of elements and arrangement of parts which are exemplified in the following detailed disclosure, and the scope of the application of which will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawings wherein:

Figure 1 is a diagrammatic, fragmentary, sectional view of portions of the camera of the self-developing type embodying the present invention;

Fig. 2 is a perspective view of an element of the sheet-arresting mechanism of Fig. 1;

Fig. 3 is a perspective view of the sheet-arresting mechanism illustrating its operation relative to a sheet material; and

Fig. 4 is an exploded perspective view of the herein disclosed manually operable release means.

Generally, the herein disclosed invention is concerned with the provision of a novel, manually operable release means in combination with mechanism for arresting the movement of sheet material. While the present invention is adapted for use in any type of apparatus wherein sheet material is advanced intermittently and mechanism is provided adapted to cooperate with portions of the sheet material for arresting its advancement, it is particularly adapted for use in photographic apparatus and, for example, in cameras of the self-developing type now well known in the art. The invention is illustrated in the accompanying drawings as embodied in a photographic apparatus of the type generally including means for processing exposed frames of a photosensitive sheet, by superposing said frames on areas of a second sheet and by spreading a thin layer of processing composition between said frames and areas.

A camera of the self-developing type embodying the herein disclosed invention is illustrated in the accompanying drawings as having an exposure chamber and a processing chamber. Successive frames of a photosensitive sheet may be successively positioned within the exposure chamber wherein they are successively photoexposed. At the entrance to the processing chamber there is provided a pair of pressure-applying rollers adapted to receive therebetween the photo-sensitive sheet from the exposure chamber and to superpose and register the frames of said sheet on areas of a second sheet. The second sheet has on one surface thereof a succession of image-receiving areas which are registrable with the frames and has affixed thereto a succession of containers of processing composition, one container being associated with one image-receiving area. When the sheets are advanced in superposed relation between the pressure-applying rollers, processing composition is ejected from a container and is spread in a thin layer between a frame of the photosensitive sheet and an image-receiving area of the second sheet, thereby forming a sandwich which is advanced into the processing chamber. By way of example, the photosensitive sheet may include a silver halide layer and the second sheet include a silver precipitating layer. The processing liquid may include a developer, a silver halide solvent and an alkali and is preferably quite viscous. When a layer of this processing liquid is spread between the photosensitive sheet and the second sheet, a latent image in the photosensitive sheet is developed into silver and a silver complex is formed from undeveloped silver halide and transferred by imbibition to the second sheet where it is developed to produce a positive image.

A stop means is provided for arresting advancement of the sandwich when one frame and the image-receiving area with which it is registered have advanced entirely between the rollers. The aforementioned frame and area are allowed to remain in the processing chamber for a predetermined time during which the latent image in the frame is developed and a positive print is formed in

the image-receiving area with which said frame is registered. At the end of the predetermined processing time the processing chamber may be opened, the developed positive print removed and advancement of the sheets repeated.

Referring now to the drawings, wherein like numerals denote like parts, there is shown somewhat schematically in Fig. 1 a handheld camera of the folding type which embodies the present invention. As a means for supporting and enclosing the various components of the camera, there is provided a housing generally indicated at 20. In the form shown, housing 20 comprises a front portion 22 which provides a central reentrant section 24 having an exposure aperture 26. Section 24 further provides guide tracks on opposite sides of the aperture 26 which serve to position a portion 27 of a photosensitive sheet 32 for exposure in the focal plane of a lens. A suitable bellows 28 is provided, the bellows being secured to section 24. It is to be understood that suitable lens, shutter means, and erecting mechanisms (not shown) are provided.

A supply of photosensitive sheet material 32 is carried on a spool 34 of conventional design and having a spindle around which sheet 32 is coiled and the spool is mounted within the housing adjacent one end of aperture 26 on a pair of suitable shafts 36 extending from opposite ends thereof and pivotally secured in clip means 38. A second sheet 40, in conjunction with which photosensitive sheet 32 may be processed, is shown in Fig. 1 as being supplied from a roll 42 mounted within the housing adjacent the other end of aperture 26. Sheet 40 preferably comprises a suitable base and a suitable image-receiving layer on one side of the base. The image-receiving layer, for example, may comprise one of the compositions now well known in the art which is adapted to receive, in successive image-receiving areas thereof, positive prints of the latent images in frames of photosensitive sheet 32. A succession of containers, designated generally at 44, are provided for carrying a liquid processing composition. As shown, containers 44 are fixed to the image-receiving layer of sheet 40 at substantially regularly spaced intervals from a location adjacent a leading end thereof toward the trailing end thereof, containers 44 being so spaced that one container is associated with one image-receiving area. Each container is provided with a mouth facing toward the trailing end of sheet 40, which mouth is adapted to eject processing composition when opposed compressional forces are applied to the container.

Means are provided defining a cylindrical chamber 43 within housing 20 wherein roll 42 may be mounted. In the form shown, said means comprise a pair of curved members 45 and 47, member 45 being secured to front casing portion 20 and member 47 being secured to rear portion 50.

Pressure-applying means are provided for processing latent images in the frames of sheet 32. In the form shown, the pressure-applying means comprise a pair of rollers 46 and 48 between which sheets 32 and 40 may be advanced in superposed relation. Advancement of a frame of sheet 32 and an associated image-receiving area of sheet 40 between the rollers causes the ejection of processing composition from the mouth of a container 44 and spreading of the processing composition between the frame and the area to form a sandwich in which the latent image in the frame is processed and a positive print is formed in the area.

Means are provided for defining an exposure chamber wherein latent images may be formed in frames of sheet 32 and a lighttight processing chamber into which a sandwich formed between rollers 46 and 48 may be stored for a predetermined processing time. Said means, in the form shown, comprise a rear portion 50 of housing 20. Viewing Fig. 1, rear portion 50 is pivotally attached to the lower extremity of front portion 22 as by a hinge 54. An intermediate portion 52 is pivotally attached to the upper extremity of front portion 22 by a hinge 56. Portions 50 and 52, when in open position, provide access to the interior of the camera. When in closed position, portion 52 defines an exposure chamber in conjunction with front portion 22 and bellows 28. When in closed position, portions 50 and 52 define, between and adjacent overlapping surfaces, a processing chamber 58. Suitable latch means (not shown) are provided for retaining rear portion 50 in closed position.

As a means for holding a portion of sheet 32 in position for exposure, there is provided a pressure plate 60 mounted on intermediate portion 52 by such means as leaf springs (not shown).

In the illustrated embodiment, roller 46 is mounted on intermediate portion 52 and roller 48 is mounted on rear portion 50, the rollers being so arranged as to be operatively juxtaposed when portions 50 and 52 are in closed position and to be spaced apart to permit sheets 32 and 40 to be threaded therebetween when portions 50 and 52 are in open position. In order to generate pressure between rollers 46 and 48, means are provided for resiliently biasing roller 46 toward roller 48 when portions 50 and 52 are in closed position. As shown, roller 46 is mounted on a pair of arms 62 which are pivotally secured to the opposite edges of intermediate portion 52. Extending from opposite ends of roller 46 are a pair of stub shafts 61 which are received in suitable bushings (not shown) in arms 62. By virtue of its mounting on pivotable arms, roller 46 is movable in a plane toward and away from roller 48 when rollers 46 and 48 are operatively juxtaposed. The resilient biasing means in the illustrated embodiment comprises a pair of coil springs 64 mounted in housing 20 and adapted to bear against enlarged sections 66 of arms 62. It is to be noted that sections 66 of arms 62 function as guides preventing lateral movement of at least a portion of sheet 32 which extends around roller 46.

In practice, sheet 32 extends from its spool past exposure aperture 26 and into contact with roller 46. Sheet 40 extends from roll 42 into contact with roller 48 and into superposition with sheet 32 to form therewith a sandwich which extends between the rollers and into processing chamber 58. Rear and intermediate portions 50 and 52 are so constructed as to provide, at the end of processing chamber 58 opposite rollers 46 and 48, an exit passage 68 through which portions of the sandwich positioned with the processing chamber may be removed. An operator, by grasping the leading portion of the sandwich extending from the passage 68, may draw the sandwich through the passage and thereby advance unprocessed portions of sheets 32 and 40 between rollers 46 and 48 into processing chamber 58. Thus, a frame of sheet 32 initially positioned for exposure in the focal plane of the lens adjacent exposure aperture 26 may be advanced toward registration within image-receiving area of sheet 40. Continued advancement of sheets 32 and 40 between rollers 46 and 48 causes ejection of processing composition from container 44 associated with the frame and area, and causes spreading of the processing composition between the frame and area to form a sandwich which advances into processing chamber 58. This sandwich is permitted to remain within processing chamber 58 for a predetermined period of time, during which the latent image in the frame is processed and a positive image is formed in the image-receiving area of sheet 40.

It is considered desirable that light be excluded from processing chamber 58 during the processing of a frame and an image-receiving area positioned therein. In accordance with the present invention means are provided for rendering exit passage 68 lighttight. As shown, this means comprises a cutter bar 70 pivotally secured by legs 72 to rear portion 50 and having edge portions which, when bar 70 is in closed position, snugly contact portions of housing 20 that are adjacent to passage 68.

Resilient means may be provided for urging bar 70 into closed position. The edge 71 of bar 70 is normally in contact with superposed sheets 32 and 40 extending from exit passage 68 and serves as a cutting blade against which an operator can draw portions of the sandwich extending through exit passage 68 for severing said portions from portions remaining within processing chamber 58.

Stop means are provided for arresting the movement of the sandwich upon advancement of a predetermined length thereof between rollers 46 and 48. In order to adapt it for use in the illustrated embodiment, sheet 40 is provided with pairs of regularly spaced perforations or openings 86, the openings of each pair being in the opposite marginal portions of sheet 40 and one pair being associated with one image-receiving area of sheet 40. The stop means include means adapted to engage successive pairs of perforations to arrest the advancement of sheets 32 and 40 at predetermined positions during their movement through the camera. In the form shown, the stop means comprise a generally channel-shaped support member 76 at least equal in length to the width of the sheets and having a base portion 78 providing a surface in contact with which the sheets are adapted to move during advancement thereof. Base portion 78 is provided with a pair of slots 88 so positioned that opening 86 in sheet 40 is adapted to move across base portion 78 in aligned relation therewith. The stop means include a curved end portion of member 45 forming an anvil 107 in contact with which the sheets are adapted to advance. Anvil 107 is provided with a pair of grooves, indicated at 108, aligned with slots 88 in base portion 78, said sheets being adapted to be advanced between anvil 107 and base portion 78. Member 76 includes two side portions 80 and 82, side portion 82 having a depending flange 81 at which member 76 is secured to rear casing portion 50. The stop means also include a substantially flat movable member 90 which underlies base portion 78 of member 76. Movable member 90 is provided with a pair of ears 92 adapted to be engaged with suitably formed slots 94 in side portion 80 of member 76, member 90 being pivotable with respect to member 76 by virtue of ears 92 which cooperate with slots 94 in side portion 80 to act as hinges. Member 90 is provided with a pair of slots 96 in aligned relation with slots 88 in base portion 78. Means, to be more fully described hereinafter, are secured to the medial portion of member 90 for pivoting or rocking the latter.

A pair of stop pins 100, which are aligned with grooves 108 and are adapted to engage a pair of apertures 86 in sheet 40, project through a pair of slots 88 in base portion 78 of support member 76 and a second pair of slots 96 in pivotal member 90. Stop pins 100 are mounted on the extremities of a spring-like detent member 98 formed of a suitable resilient material, for example spring steel or Phosphor bronze. Detent member 98 is adapted to mount pins 100 so that they are movable either together or separately in a plane perpendicular to the sheets and, in the form shown, comprises a central section 102, a second section 110 depending from said central section, and a pair of end sections 112 extending from said second section 110 in substantially the plane of said central section 102. Central section 102 is provided with a hole 104 formed therein through which means such as a rivet 106 may be inserted for rigidly securing section 102 to the mid portion of pivotal member 90. By virtue of the construction of detent member 98, stop pins 100 mounted thereon are movable longitudinally of slots 88 and 96, through which they project in a direction substantially parallel to the direction of advancement of the sheets and are also movable into and out of the pairs of openings 86 in sheet 40 in a direction substantially normal to the direction of movement of the sheets. Detent member 98 is secured at its central section 102 to pivotal member 90 whereby pivoting of the latter results in the engagement of pins 100 with a pair of perforations 86 or their withdrawal from said perforations.

Resilient means are provided for normally urging stop pins 100 into engagement with a pair of openings 86 in sheet 40 with which they become aligned during the advancement of the sheets between anvil 107 and base portion 78. The resilient means comprises at least one compression spring located between rear casing portion 50 and pivotal member 90 and, in the form shown, comprise a coiled spring 114 engaged at its ends by rear casing portion 50 and the mid-section of pivotal member 90. Stop pins 100 are urged by spring 114 toward the sheets and are so positioned with respect to slots 88 and 96 that they are movable in said slots against the bias of detent member 98 in the direction of advancement of the sheets.

Normally, the stop pins 100 are held in contact with sheet 40 by the action of spring 114 so that they bear against or ride on the surface of said sheet as it advances between base portion 78 and anvil 107 of member 45. To permit pins 100 to extend completely through the sheets, anvil 107 is provided with grooves 108 aligned with the pins over which the perforations in the sheets advance. As a perforation 86 becomes aligned with a pin 100, the pin enters said perforation while the sheet continues to advance in engagement with said pin for a distance equal to the length of slots 88 and 96 through which the pin projects. The pins are carried forward by the sheets in the direction of advancement of the latter to the limits of slots 88 and 96 where their movement, as well as that of the sheet, is arrested by said limits. As pins 100 are carried forward, detent member 98, and particularly the second sections 110 thereof, is deformed or deflected, thereby providing a bias on pins 100 in a direction opposite the direction of movement of the sheets.

Means are provided for withdrawing stop pins 100 from engagement with a pair of perforations 86 in sheet 40 to permit the further advancement of the sheets through their exposure and processing cycles. In the form shown, the aforesaid stop pin withdrawal means comprises a lever 116 having a substantially flat end section 118 at which it is secured by such means as rivet 106 to the midportion of pivotal member 90. Lever 116 includes an arm section 120 having a first portion 120*a* extending angularly upward (as viewed in Fig. 4) from end section 118 to an apex 121 and a second portion 120*b* bent downwards from apex 121 of arm section 120 and curved upward at its end 122. Arm section 120 may be provided with a groove or rib 124 formed therein for added strength and rigidity at its apex 121. To provide a rigid structure and prevent bending of lever 116 at the point where end section 118 and arm section 120 join, the lever is provided with a pair of lateral side or flange portions 125 extending between said end section 118 and the first portion 120*a* of arm section 120. Withdrawal of stop pins 100 from engagement with a pair of perforations 86 in sheet 40 is effected by pivoting lever 116 and pivotal member 90 secured thereto. Upon withdrawal from engagement with perforations 86, stop pins 100 move under the bias of second sections 110 of detent member 98 in a direction opposite the direction of movement of the sheets to the limits of slots 88 and 96 and are retained thereat in engagement with the surface of sheet 40 until advancement of said sheet results in the alignment of another pair of perforations 86 with pins 100. While the sheets have been illustrated as being provided with pairs of apertures or perforations adapted to be engaged by pins, it is to be understood that the sheets may also be provided with marginal notches, hooks, or raised sections adapted to be engaged by suitable stop members.

In accordance with the present invention, manually operable means are provided for momentarily pivoting lever 116 so as to withdraw stop pins 100 from engage-

ment with openings 86 in sheet 40. In the form shown, said means comprise an actuating lever 126 and a retainer plate 128. Actuating lever 126 includes a curved central portion 130 and two end portions 132 and 134 extending, respectively, upward and downward (Fig. 4) from said central portion 130. Lever 126 is adapted to be retained in a recess, generally indicated at 136, formed in the rear portion 50 of the camera housing with end portion 132 extending through an opening 138 in said housing. End portion 132 may be serrated or grooved and is manually engageable for pivoting lever 126. The central portion 130 of lever 126 is substantially wider than end portions 132 and 134 and includes a round hole 140 extending from side to side thereof and adapted to receive an elongated shaft or pin 142, a curved upper surface 144, and a circular lower surface 146, the center of curvature of said lower surface 146 being the axis of hole 140. Pivot uin 146 projects from opposite sides of said central portion 130 and is received in suitably formed recesses in rear portion 50 of the camera housing for pivotally mounting lever 126. To retain lever 126 in its operative pivotal position within recess 136 in the housing with end portion 132 projecting through opening 138, retainer plate 128 is substantially rectangular, having a recess or circular depression 148 formed therein and adapted to receive central portion 130 of lever 126, said depression 148 having an upper surface conforming to the lower surface 146 of central portion 130. Retainer 128 includes an opening 150 in depression 148 through which lower end portion 134 of lever 126 is adapted to extend, and holes 152 at its corners through which means such as screws or rivets 154 may be inserted to secure retainer 123 within recess 136. When assembled, the actuating lever 126 is pivotable about pin 142 and is retained in operative position by pin 142 and central portion 130 which is retained in depression 148 of retainer plate 128.

A further feature of the present invention resides in the provision of means adapted to permit only the momentary or instantaneous pivoting of lever 116 and member 98 whereby stop pins 100 are withdrawn from perforations 86 in sheet 40. Immediately upon withdrawal of pins 100 from perforations 86, the pins are again urged into contact with sheet 40 and positioned to engage the next successive pair of perforations as they are advanced into alignment with the pins. It is apparent that by this means the pins cannot be withdrawn from contact with sheet 40 while the sheet is advanced and that as a pair of perforations 86 in sheet 40 are advanced into alignment with said pins, said perforations must necessarily engage the pins, thereby arresting the advancement of the sheets. Pivoting of release lever 116 is effected by the action of end portion 134 of actuating lever 126 as it is pivoted by the operator. End portion 134 is adapted normally to contact arm section 120 of lever 116 at a point on said arm section 120 adjacent either of its ends and is illustrated (in Fig. 1) as contacting arm section 120 adjacent its end 122. As actuating lever 126 is pivoted, end portions 134 moves toward the apex 121 of arm section 120 as it rides on and bears against either first portion 120*a* or second portion 120*b*, thereby deflecting or pivoting lever 116. At the instant when end portion 134 of lever 126 rides over the apex 121 of arm section 120, the pivotal movement of lever 116 is a maximum and stop pins 100 are withdrawn from engagement with perforations 86 in sheet 40. The end of portion 134 of lever 126 is rounded, making it substantially impossible to hold lever 126 at apex 121 of arm portion 120 and thereby hold pins 100 out of engagement with sheet 40. Thus, by a single pivotal movement of the actuating lever 126, the stop pins are withdrawn from engagement with the sheets and advancement of the latter is permitted. The foregoing construction and arrangement of elements has obviated the possibility of the stop pins 100 being held out of engagement with sheet 40 by the operator so that said stop pins do not engage successive pairs of perforations 86 and permit the uninterrupted advancement of the sheets through the camera.

Since certain changes may be made in the above apparatus without departing from the scope of the invention herein involved, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. In photographic apparatus, means for arresting the movement of sheet material through said apparatus, said means including at least one stop member for engaging successive engageable portions of said sheet material to arrest its movement, resilient means for mounting said stop member for movement in a plurality of directions and for urging said stop member into contact with said sheet material and in a direction substantially opposite the direction of advancement of said sheet material, said stop member being displaceable in the direction of movement of said sheet material upon being engaged by one of said engageable portions of said sheet material, pivotal means for limiting the displacement of said stop member in the direction of advancement of said sheet material to arrest the movement of said sheet material and for moving said stop member in a direction substantially normal to the direction of advancement of said sheet material to withdraw said stop member from engagement with said sheet material and permit the displaced stop member to return under the bias of said resilient means to its normal position prior to displacement, said stop member in its normal position being in contact with said sheet material in readiness to be engaged by the next successive engageable portion of said sheet material as the latter is advanced into alignment with said stop member, and control means for causing said pivotal means to only momentarily withdraw said stop member from engagement with said sheet material, said control means comprising a manually engageable lever having an end portion extending exteriorly of said apparatus, a central portion at which it is mounted for limited pivotal movement within said apparatus and an actuating portion having a curved end section movable in an arcuate path, said pivotal means including a generally V-shaped section having a curved apex located in the arcuate path of said curved end section of said actuating portion for coacting with said curved end section during arcuate movement thereof in either direction for momentarily pivoting the last-mentioned means so as to move said stop member against the bias of said resilient means from engagement with said sheet material.

2. In photographic apparatus, means for arresting the movement of sheet material through said apparatus, said means including a pair of stop members for engaging successive pairs of perforations in said sheet material to arrest its movement, resilient means for mounting said stop members for movement independent of one another in a plurality of directions and for urging said stop members into contact with said sheet material in a direction substantially perpendicular to its direction of movement and in a direction substantially opposite the direction of movement of said sheet material, each of said stop members being displaceable in the direction of movement of said sheet material upon engagement by one of said perforations, pivotal means positioned between said resilient means and said sheet material, said pivotal means including means for limiting the displacement of each of said stop members in the direction of movement of said sheet material so as to arrest its movement and means for moving said stop members in a direction substantially perpendicular to the direction of movement of said sheet material to withdraw said stop members from engagement with said perforations and permit the displaced stop members to return under the bias of said resilient means to their normal position prior to displacement, said stop

members in said normal position being in contact with said sheet material in readiness to be engaged by the next pair of perforations as the latter move into alignment with said stop members, and control means cooperating with said pivotal means for only momentarily withdrawing said stop members from engagement with said sheet material, said control means comprising a manually engageable lever having an end portion extending exteriorly of said apparatus, a central portion at which it is mounted for limited pivotal movement within said apparatus and an actuating portion having a curved end section movable in an arcuate path, said pivotal means including a generally V-shaped section having a curved apex located in said arcuate path of movement of said curved end section of said actuating portion for coacting with said curved end section during arcuate movement thereof in either direction to momentarily pivot the last-mentioned means so as to move it against the bias of said resilent means and withdraw said stop members from engagement with said sheet material.

3. In photographic apparatus, means for arresting the movement of sheet material through said apparatus, said means including at least one stop member for engaging successive engageable portions of said sheet material to arrest its movement, resilient means for mounting said stop member in contact with said sheet material and for limited movement in a plurality of directions so that said stop member is displaceable from its normal position in the direction of movement of said sheet material upon engagement with an engageable portion thereof, said resilient means so mounting said stop member as to return the latter to its normal position upon the momentary disengagement of said stop member from said engageable portion, control means for only momentarily withdrawing said stop member from engagement with said sheet material, said control means comprising a lever having an end portion extending exteriorly of said apparatus, a central portion at which said lever is mounted for limited pivotal movement within said apparatus and an actuating portion having a curved end section movable in an arcuate path when said lever is pivoted, pivotal means for moving said stop member from engagement with said sheet material in a direction substantially normal to the direction of movement of said sheet material, said resilient means cooperating with said pivotal means for normally urging said stop member into contact with said sheet material, said pivotal means having a portion bent at an obtuse angle with its apex positioned in said arcuate path of movement of said curved end section of said actuating portion, said curved end section of said actuating portion being capable, during pivotal movement in either direction, of coacting with said angular portion to cause a momentary deflection of said angular portion of said pivotal means and thereby pivot the latter, pivotal movement of said pivotal means being effective to momentarily withdraw said stop member from engagement with said sheet material at the instant said curved end section of said lever is in coaction with said apex of said angular portion.

4. In photographic apparatus, means for arresting the movement of sheet material through said apparatus, said means including a pair of stop pins for engaging successive pairs of perforations in said sheet material to arrest its movement, resilient means for mounting said stop pins for limited movement independent of one another in a plurality of directions so that each stop pin is displaceable from its normal position in the direction of advancement of said sheet material upon engagement with one of said pair of perforations, the momentary disengagement of a displaced stop pin from said perforation permitting said stop pin to return under the bias of said resilient means to its normal position in preparation for engagement by one of the next pair of perforations in said sheet material as said perforation is advanced into alignment with said pin, and control means for only momentarily withdrawing said stop pins from engagement with said sheet material, said control means comprising a lever having a manually engageable end portion extending exteriorly of said apparatus, a central portion at which said lever is mounted for limited pivotal movement within said apparatus and an actuating portion having a curved end movable in an arcuate path, pivotal means for effecting the movement of said stop pins from engagement with said sheet material in a direction substantially perpendicular to the direction of movement of said sheet material, said resilient means cooperating with said pivotal means for normally urging said stop pins into contact with said sheet material, said pivotal means having a base portion at which it is pivotally mounted, said base portion being positioned between said resilient means and said sheet material and having a pair of slots through which said pins project and adapted to limit the displacement of said pins, and an angular arm portion extending from said base portion, said arm portion being bent at an obtuse angle intermediate its ends with the apex of said angular arm portion located in said arcuate path of movement of said actuating portion, said curved end of said actuating portion being so formed as to coact with said arm portion during pivotal movement of said lever in either direction to deflect said arm portion and momentarily pivot said pivotal means against the bias of said resilient means only when said curved end of said actuating portion is in coaction with said apex for momentarily withdrawing said displaced stop pins from contact with said sheet material to permit the return movement of said stop pins to their normal position.

References Cited in the file of this patent

UNITED STATES PATENTS

1,183,215	MacDonald	May 16, 1916
1,307,386	Waite	June 24, 1919
1,535,930	MacDonald	Apr. 28, 1925
1,740,279	Bornmann	Dec. 17, 1929
1,828,205	Schmitt et al.	Oct. 20, 1931
1,959,922	Maspons	May 22, 1934
2,543,159	Fairbank	Feb. 27, 1951