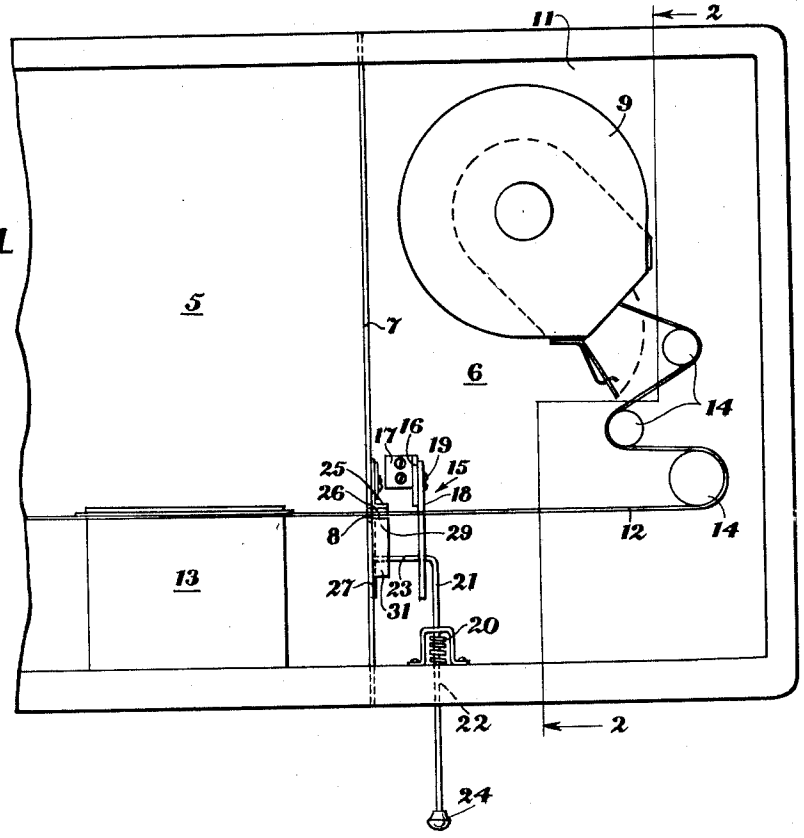
May 12, 1964 D. L. CHAMPLIN ETAL 3,132,573

LIGHT-LOCK AND SEVERING MECHANISM

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Fig. 1



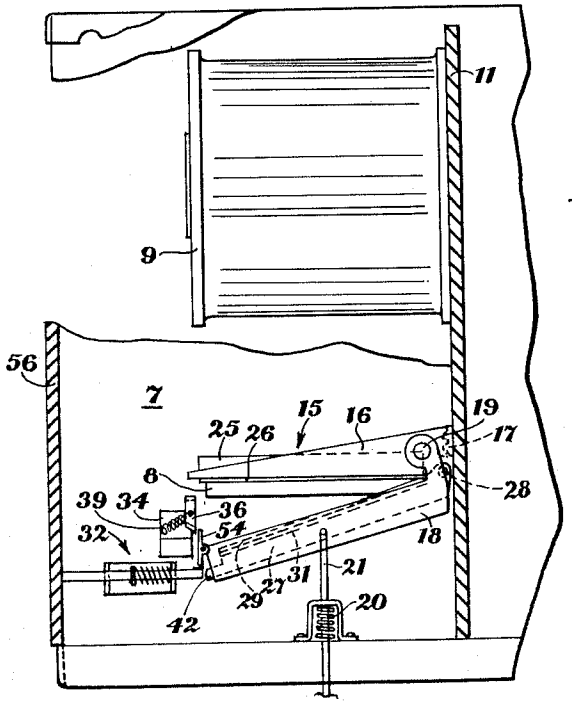


Fig. 2

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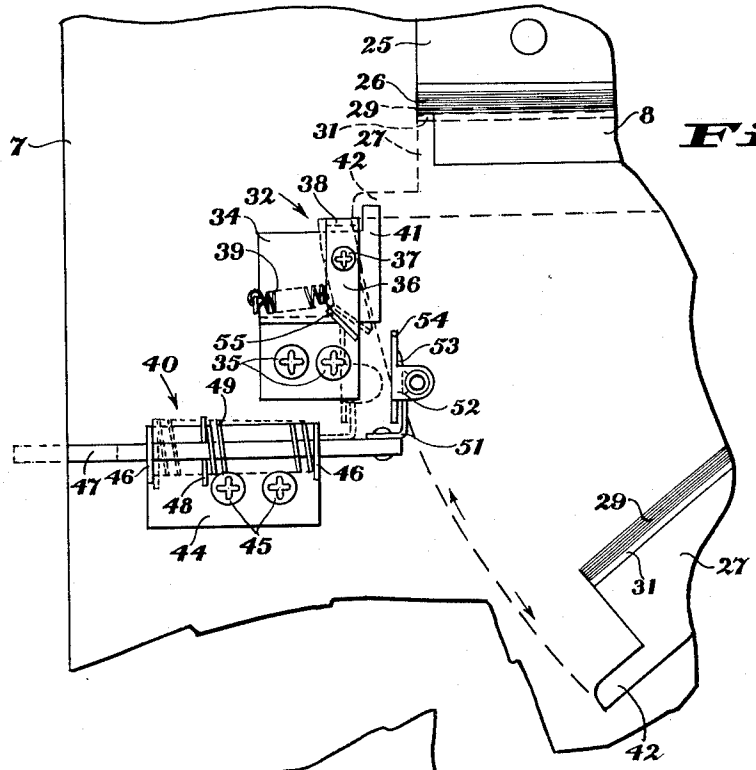


Fig. 3

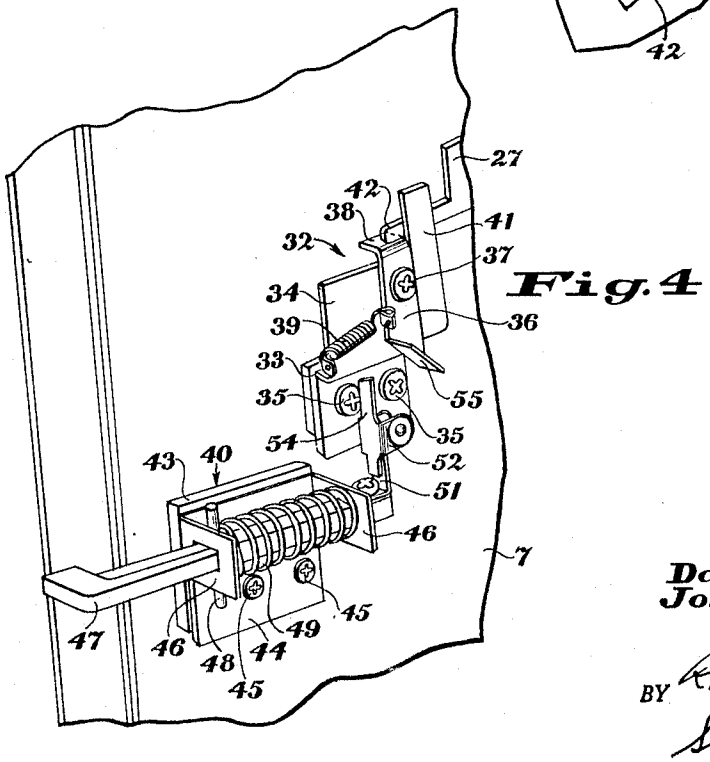


Fig. 4

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LIGHT-LOCK AND SEVERING MECHANISM

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7 Claims. (Cl. 95—31)

This invention relates generally to light-lock mechanisms, and more specifically to a combination light-lock and severing mechanism for isolating adjacent chambers and selectively severing a light sensitive web material transported from one chamber to the other.

This invention is particularly suited for use in a photographic printer having a single printing chamber in which a printing station is interposed between supply and take-up rolls of photographic material or paper. The paper is transported from the supply roll through the printing zone or station where it is exposed and then wound upon the take-up roll as is well known in the art. Since the photographic paper is light-sensitive, in the event the operator has made a series of exposures on a portion of the paper and desires to process that portion, it is necessary for the operator to open the printing chamber in a darkened room, sever the exposed portion of the paper and remove it for processing. Since this operation must be conducted in a dark room, it is not unusual for the operator to sever the paper in a wrong place thereby ruining one of the exposures or wasting some of the paper. Other obvious disadvantages are the difficulty involved and inconvenience of working in a dark room.

The present invention is believed to obviate these disadvantages by providing an apparatus having adjacent chambers, each adapted to be closed off by a door, one chamber housing the supply roll of light sensitive paper and exposing station, and the other chamber housing the take-up roll. The common partition dividing the chambers has an opening through which the paper is transported, and the partition is further provided with a light-lock structure movable between an open position in which the opening is unobstructed, and a closed position for closing this opening and isolating the chambers. A cutting apparatus is mounted in the second chamber for severing the paper, and the light-lock structure and cutting mechanism are connected together for simultaneous operation, the cutting mechanism severing the paper as the light-lock structure is moved into its closed position. The exposed paper is then wound by the operator onto the take-up roll which is mounted on a lighttight removable magazine. The operator may then open the door to the second chamber and remove the lighttight magazine for processing. All of these operations are performed by the operator in broad daylight.

One of the primary objects of the present invention is to provide an improved combination light-lock and cutting mechanism for a printer or the like for severing a light-sensitive paper transported through the chambers, and isolating the chambers so that light from one of the chambers, when opened, cannot enter the other chamber.

Another object of this invention is to provide an improved printer or the like having means whereby an exposed portion of light-sensitive paper may be severed, wound in a lighttight magazine, and removed from the printer in broad daylight without exposing the remaining light-sensitive paper in the printer.

Still another object of this invention is to provide a combined light-lock and cutting mechanism for a printer or the like of simple design and construction, thoroughly reliable and efficient in operation, and economical to manufacture.

A more specific object of this invention is to provide an improved printer or the like having adjacent lighttight supply and take-up chambers, a light-sensitive paper transported from the supply to the take-up chamber, and a combined light-lock and cutting mechanism for simultaneously severing the light-sensitive paper and light-locking the supply chamber so that the take-up chamber may be opened without exposing the light-sensitive paper remaining in the supply magazine.

Objects and advantages of other than those set forth above will be apparent from the following description when read in connection with the accompanying drawings, in which:

FIG. 1 is a segmental side elevation view of a portion of a photographic printer in which a preferred embodiment of the present invention is embodied, the latch device being omitted for purposes of clarity;

FIG. 2 is a segmental view with a portion thereof broken away taken substantially along line 2—2 of FIG. 1 and looking in the direction of the arrows, the latch mechanism being incorporated therein;

FIG. 3 is an enlarged segmental view of a portion of the structure of FIG. 2; and

FIG. 4 is a perspective view showing the combined light-lock and cutting mechanism of this invention.

As shown in the drawings, particularly FIG. 1, a portion of a printer is disclosed having respective supply and take-up chambers 5, 6 separated by a common partition 7 having a slot opening 8 therein. A lighttight take-up magazine 9 of any known type is removably secured to the back wall 11 of chamber 6 for rotatably supporting a core, not shown, upon which a web of light-sensitive photographic paper 12 is wound. A similar lighttight supply magazine, not shown, for rotatably supporting a supply roll of photographic paper is mounted in supply chamber 5, and the paper is transported from the supply magazine through a printing station 13 where it is exposed in a well known manner, through opening 8 in partition 7, around suitable guide rollers 14, and subsequently wound on a core in take-up magazine 9.

The cutting mechanism 15 for severing the photographic paper 12 comprises a fixed blade 16 having a bent flange 17 at one end secured to wall 11 by rivets or the like. A movable knife blade 18 is pivotally mounted on a stud 19 carried by fixed blade 16, and the two blades 16, 18 co-operate to form a scissors for severing the paper 12 in a well known manner. A lever 21 extends through a light-lock proof opening 22 in the bottom of chamber 6 and has a bent end 23 extending through an opening in blade 18, and a handle 24 at its other end by which the operator may pivotally move blade 18 from a non-cutting position to a cutting position upon movement of lever 21 from its inoperative position to its operative position against the bias of its spring 20.

The light-lock mechanism comprises plate 25 adjustably mounted by means of studs and slots on partition 7 adjacent the upper edge of opening 8. The plate 25 has a strip of felt 26, or similar light-lock material, secured to its underside. Another plate 27 is pivotally mounted on a pin 28 secured to partition 7, and further has a strip of felt 29 secured thereto and is adapted when moved from an open poistion to a closed position to co-operate with plate 25 to cover slot 8 and prevent any light leak into supply chamber 5. The plate 27 has a rib 31 engageable by end 23 of lever 21, and plate 27 and blade 18 are simultaneously moved into their respective closed and cutting positions upon movement of lever 21 to its operative position. When lever 21 is released, spring 20 returns it to its inoperative position.

A latch device 32 for the light-lock mechanism 15 as seen best in FIGS. 3 and 4 comprises a base member 33 secured to partition 7, and a support bracket 34 adjustably mounted on base 33 by means of studs 35. A pawl 36 is pivotally mounted on bracket 34 at 37 and has a bent end 38 urged by a spring 39 interposed between

bracket 34 and pawl 36 against a spring arm 41 extending from bracket 34. The bent end 38 of pawl 36 further forms a catch for a projection 42 on the other end of plate 27. The bracket 34 and pawl 36 are properly positioned so that projection 42, upon pivotal movement of plate 27 behind arm 41 to its closed position, engages end 38 of pawl 36 and cams it in a counter clockwise direction against the bias of spring 39. When projection 42 moves past the end 38 of pawl 36, the pawl returns to its original position, positioning its end 38 below projection 42 for releasably holding plate 27 in its closed position as seen in FIG. 4. The spring arm 41 of bracket 34 bears against projection 42 for moving plate 27 into tight engagement with partition 7.

A release mechanism 40 for latch device 32 comprises a base member 43 secured to partition 7 for adjustably supporting a support bracket 44 by means of studs 45. The bracket 44 has spaced apart flanges 46 having openings therein for slidably receiving a slider 47. The slider 47 has a pin 48 extending therethrough, and a helical spring 49 interposed between one of the flanges 46 and pin 48 for urging slider 47 outwardly. An arm 51 is secured to one end of slider 47 and pivotally supports a toggle member 52 which is biased by a spring 53 in a counter clockwise direction causing one end thereof to engage arm 51. The opposite end 54 of toggle 52 is adapted upon inward movement of slider 47 to engage a beveled, or inclined ear 55 formed on the opposite end of pawl 36 for camming the pawl in a counter clockwise direction withdrawing its end 38 from projection 42 for releasing plate 27. Upon movement of slider 47 in the opposite direction by virtue of spring 49, the toggle end 54 engages ear 55 of pawl 36, which is prevented from moving therealong by virtue of arm 41, causing toggle 52 to be moved in a clockwise direction against the bias of its spring 53 as end 54 passes underneath ear 55. When end 54 clears ear 55, toggle 52 is returned to its original position, but is now on the opposite side of ear 55 as seen in FIG. 4 and in position to engage it upon inward movement of slider 47. The opposite end of slider 47 is engageable by a door 56 as seen in FIG. 2 to take-up chamber 6, and the reciprocal movement of slider 47 is controlled by the opening and closing of door 56.

In the operation of this invention, let us assume initially that take-up chamber door 56 is opened, light-lock plate 27 is in its open position and cutting blade 18 in its non-cutting position. The operator would then turn off the light and in the darkened room would thread the photographic paper 12 through printing station 13, opening 8 and onto a core in take-up magazine 9. The operator then closes door 56, turns on the light, and the printer is in position for operation.

Let us assume that the operator runs off a series of exposures on the photographic paper 12 and desires to immediately process the exposed portion of paper. The operator initially advances photographic paper 12 until the last exposure is clear of cutting mechanism 15. The operator then grasps handle 24 of lever 21 and moves it upwardly to its operative position against the bias of spring 20 causing cutting blade 18 and light-lock plate 27 to simultaneously move into their respective cutting and closed positions for severing the photographic paper and closing opening 8 in partition 7 between the respective supply and take-up chambers 5, 6. Upon release of lever 21, plate 27 is releasably retained in its closed position by end 38 of pawl 36 while blade 18 is returned to its non-cutting position by virtue of spring 20. The operator then winds up the exposed portion of paper 12 into the light tight magazine 9, and when the wind-up is completed, turns on the light and opens the take-up chamber door 56 whereupon slider 47 moves outwardly positioning its toggle 52 on the opposite side of ear 36. The operator removes light tight magazine 9 from take-up chamber 6 for processing, and positions another magazine

in the take-up chamber. He then splices a leader onto the end of the paper remaining in take-up chamber 6 and attaches the other end of the leader to the core of take-up magazine 9. The operator then closes door 56 to take-up chamber 6 which engages slider 47 and urges it inwardly causing toggle end 54 to engage ear 55 and pivot pawl 36 in a counter clockwise direction to release light-lock plate 27 which is moved by gravity to its open position. The operator may then continue the operation of the printer.

The invention has been described in detail with particular reference to a preferred embodiment thereof, but it will be understood that variations and modifications can be effected within the spirit and scope of the invention as described hereinabove and as defined in the appended claims.

We claim:

1. In a light-lock and severing mechanism for isolating adjacent chambers having a common partition and severing a light-sensitive web transported from one chamber through an opening in the partition to the other chamber, the combination comprising: light-lock means including a portion thereof movable from a normal open position in which said partition opening is unobstructed to a closed position in which said opening is closed; cutting means including a blade movable between non-cutting and cutting positions for severing said web; means movable from an inoperative position to an operative position for simultaneously moving said movable portion and said blade to their respective closed and cutting positions; and latch means for releasably holding said movable portion in its closed position upon return of said moving means and said blade to their respective inoperative and non-cutting positions.

2. The invention according to claim 1 wherein one of said chambers has a door, and release means are provided for said latch means, said release means being responsive to the closing of said door to release said latch means.

3. The invention according to claim 1 wherein said latch means comprises a spring biased pivotal pawl engageable with said movable portion.

4. The invention according to claim 1 wherein said latch means comprises a spring biased pivotal pawl engageable with said movable portion, said pawl having an ear at one end thereof, and said release means comprises a reciprocably movable spring biased slider, said slider having a spring biased toggle at one end thereof adapted to pass under said ear when said slider is moved by its spring in one direction, and to engage said ear and urge said pawl out of engagement with said movable portion for releasing same when said slider is moved in the opposite direction.

5. The invention according to claim 4 wherein one of said chambers has a door which is adapted when closed to engage the opposite end of said slider and urge it in the opposite direction.

6. The invention according to claim 1 wherein said movable portion comprises a light-lock plate, and said moving means comprises a reciprocably movable lever extending into one of said chambers and having a handle at one end, and its opposite end connected to said blade and further adapted to engage said plate.

7. The invention according to claim 7 wherein said plate is pivotal and has a rib engageable by said opposite end of said lever, said opposite end further passing through an opening in said blade.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,132,573 May 12, 1964

David L. Champlin et al.

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 4, line 63, for the claim reference numeral "7" read -- 6 --.

Signed and sealed this 20th day of October 1964.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

EDWARD J. BRENNER
Commissioner of Patents

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