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TAKE-UP LATCH MECHANISM

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Fig. 1

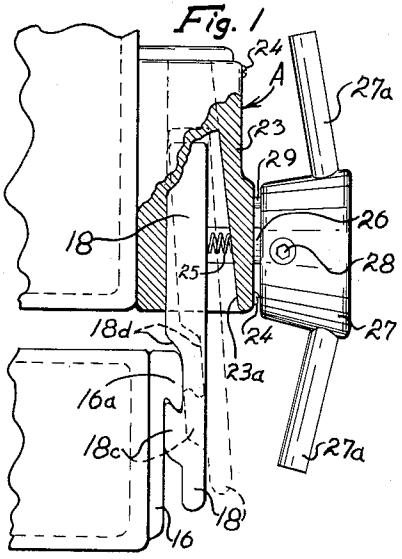


Fig. 2

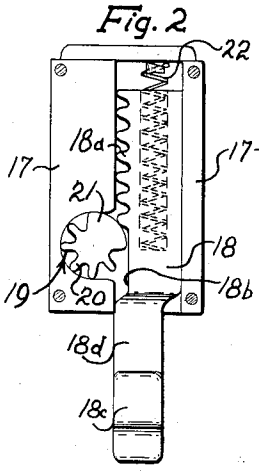


Fig. 3

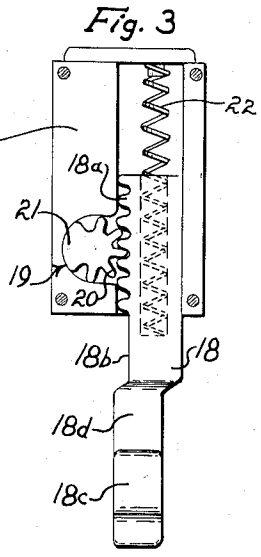


Fig. 4

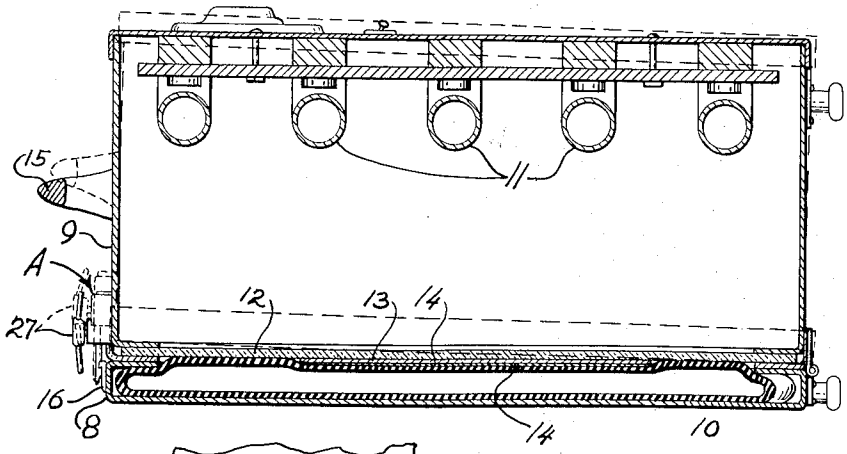
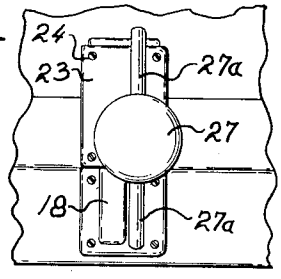


Fig. 5



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TAKE-UP LATCH MECHANISM

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Application January 24, 1952, Serial No. 268,084

6 Claims. (Cl. 292—112)

This invention relates to a take-up latch mechanism.

It is an object of this invention to provide a novel and highly efficient positive take-up latch mechanism adapted to forcibly close two sections of a casing from partially open position to tightly closed clamped together position.

It is another object to provide a take-up latch mechanism having an elongated longitudinally shiftable take-up member adapted to be forcibly shifted from fully projected to fully retracted position and positively close a pair of casing sections from partially open to tightly closed and clamped together position.

More specifically, it is an object to provide a longitudinally shiftable take-up member having a toothed rack with an enlarged recess formed at the lower end thereof and a rotatable cooperatively toothed actuating and locking pinion intermeshed with the teeth of said take-up rack for positively projecting the same from fully projected to fully retracted position, said pinion having a locking cam formed around a portion of the periphery thereof to be received in the recess at the lower end of the reciprocated rack and engage the lower tooth thereof with a locking force by an over center locking action.

These and other objects and advantages of this invention will more fully appear from the following description made in connection with the accompanying drawings wherein like reference characters refer to the same or similar parts throughout the several views and in which:

Fig. 1 is a side elevational view of the take-up latch mechanism with a portion thereof broken away;

Fig. 2 is a rear elevational view thereof with the outer cover plate removed and showing the reciprocated take-up member in fully retracted locked position;

Fig. 3 is a view similar to Fig. 2 showing the reciprocated member in partially projected position;

Fig. 4 is a vertical sectional view showing the take-up latch mechanism as mounted on a photographic portable printing device showing the cover in partially raised position by dotted lines; and

Fig. 5 is a fragmentary front elevational view thereof with the two casing sections in tightly clamped together position.

As illustrated in the accompanying drawings, we provide a casing for a portable photographic printing apparatus such as is disclosed in the application entitled Device for Acurately Exposing Sensitized Plates, filed June 15, 1951, Serial No. 231,792, and requiring that the upper section and lower section of the casing be tightly clamped together to produce positive contact between the surface area of a sensitized plate and the negtaive through which the same is to be printed. Such a photographic printing device is illustrated in Fig. 4 and has a lower section **8**, an upper section **9**, a pressure-applying and equalizing bag **10** in the lower section, and a light source **11** in the upper section. A transparent pressure plate **12** mounted across the bottom of the upper section positively engages the top surface of the pneumatic bag **10** and a photographic negative **13** through which a sensitized plate **14** is to be printed. A lifting handle **15** is fixed to the front

end portion of the upper section **9** and a fixed catch member **16** is secured to the central portion of the lower section **8** at the front edge thereof.

Our take-up latch mechanism, designated as an entirety by the letter A, is mounted directly above the fixed catch **16** and is secured to the front portion of the upper section **9**. The take-up latch has a body **17** with a milled upstanding groove formed in the outer portion thereof and in which the upper portion of a reciprocated elongated toothed take-up member is slidably mounted and is designated by the numeral **18**. A rotatable pinion **19** is journalled in said body member and has a plurality of spaced teeth **20** around only a portion of the periphery thereof. A locking cam **21** is formed around the remainder of the periphery, as best shown in Figs. 2 and 3. The teeth **18***a* of the reciprocated take-up member **18** form a rack along the edge thereof adjacent the pinion **19** and the teeth **20** of the pinion **19** are intermeshed with the teeth **18***a* of said rack. A recess **18***b* is formed at the bottom of the rack and is adapted to receive the cam **21** when the teeth **20** ride off of the rack **18***a*. The cam **21** engages the lowermost tooth of the rack to securely lock the reciprocated latch member **18** in upwardly retracted position.

A resilient spring member **22** urges the reciprocated latch member downwardly to maintain engagement of the teeth **18***a* with the cam even though no pressure is exerted to open the casing, thus positively intermeshing the teeth of the rack with the teeth **20** of the pinion when the cam **21** is rotated downwardly out of the recess. A cover plate, best shown in Fig. 1, encloses the groove in which the reciprocated take-up member is shiftably mounted. This cover plate is designated by the numeral **23** and is secured to the outer face of the body **17** as by any suitable means such as the screws **24**, best shown in Fig. 1. The inner surface of said cover plate is grooved out in opposed relation to the guiding groove for the take-up member **18** and said groove in the cover plate **23** is deeper at the lower end thereof than at the upper end, as best shown in Fig. 1, and thus permits the lower end of the elongated take-up member to swing outwardly and form a spring latch mechanism in combination with the fixed catch **16**. Any suitable means for resiliently urging said member **18** inwardly may be provided such as the compression spring **25** interposed between the outer face of member **18** and the opposed portion of the wedge shaped groove formed in cover plate **23**, which groove is designated by the numeral **23***a*. The lower portion of the reciprocated take-up member **18** has a cooperating interfitting latch element **18***c* with a recess **18***d* formed immediately thereabove. The catch **16** has a fixed latch element **16***a* formed in the upper portion thereof and is adapted to be received in recess **18***d* when the latch element **18***c* is moved downwardly therebelow to interfit therewith. The engaging locking surfaces of the cooperating latch elements **16***a* and **18***c* are beveled to form a tightly wedged connection therebetween when upwardly directed pressure is applied to take-up member **18**. The upper end portion of the catch **16** and the lower end portion of the latch element **18***c* are beveled to produce engaging camming surfaces adapted to shift the lower portion of member **18** outwardly whereby the latch element **18***c* rides downwardly over the cooperating latch element **16***a*.

An actuating shaft **26** is fixed at one end to pinion **19** and has suitable gripping means such as the turning knob **27** fixed to the outer end thereof as by a set screw **28**. A gripping knob **27** has a pair of outstanding gripping arms **27***a* to assist in forcibly turning said pinion **19**. A suitable pair of stop elements **29** are respectively fixed to the inner portion of knob **27** and the outside of cover plate **23** through which shaft **26** extends and in which

said shaft is journalled. These stop elements **29** limit the rotation of the knob **27** to substantially one complete revolution. Obviously, the teeth of the rack and pinion are of such a pitch that one complete revolution of shaft **26** is more than sufficient to fully retract reciprocated latch member **18** from fully projected position.

The casing for the photographic printer, shown in Fig. 4, is one example of a housing or enclosing unit requiring a take-up type of latch mechanism and in the operation of this particular device the pneumatic pressure bag **10** is inflated to a degree requiring compression of the air therein to close the two sections **8** and **9** together. In this way the photographic negative **13** and sensitized plate **14** are tightly clamped together over their entire engaged surface areas by the pressure of the glass pressure plate **12** against the top thereof. When the negative **13** and plate **14** have been placed on the bed formed by the pneumatic pressure bag **10**, the top cover **9** is lowered into engagement with the negative and a rolling action from the hinged interconnected edges of the two sections **8** and **9**, such as that described in the previously identified co-pending application, is produced. Sufficient downward pressure is applied by the operator to engage the two latch elements **16***a* and **18***c* into interlocked relation with the take-up member **18** in fully projected position. When the latch element **18***c* has ridden downwardly over the outer surface of latch element **16***a* and said element **16***a* has been received in the recess **18***d* of the take-up member **18**, the knob **27** may be rotated in a clock-wise direction as viewed from the front (Figs. 2 and 3 are rear views of the rack and pinion mechanism) to forcibly move the take-up member **18** upwardly and tightly clamp the two casing sections **8** and **9** together. When the teeth **20** ride off the teeth **18***a* of the take-up rack, the locking cam **21** engages the lowermost tooth **18***a* of the rack and positively locks the same to hold the take-up member **18** in fully retracted position and the stops **29** limit the rotation of the pinion **19** before the cam **21** rides upwardly off the lowermost tooth **18***a*.

It will be seen that we have provided a novel and highly efficient take-up latch mechanism for forcibly closing a pair of hinged sections or the like through the use of a rack and pinion to impart the take-up movement and a locking cam formed around a portion of the periphery of the pinion to positively engage the lowermost tooth of the rack and ride upwardly thereon to securely hold the take-up member on which the rack is mounted in upwardly projected position. By mounting said member **18** with freedom for outward shifting movement of the lower end portion thereof against the yielding force of spring **25**, a spring latch mechanism is produced which snaps into interlocked position when the latch element **18***c* has ridden downwardly over the fixed latch element **16***a*.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the parts without departing from the scope of this invention which, generally stated, consists in the matter shown and described herein and set forth in the appended claims.

What we claim is:

1. A take-up latch mechanism adapted to engage a fixed catch on one of a pair of hinged casing sections, said take-up latch comprising a body member provided with longitudinal guiding means, an elongated reciprocated take-up member shiftably mounted in said guiding means, a catch engaging latch element mounted at the outer end of said take-up member, a toothed rack fixed along at least one edge portion of said take-up member, a rotatable pinion journaled in said body and having the teeth thereof intermeshed with the teeth of said rack to forcibly reciprocate said take-up member into and out of take-up position, and a locking cam shiftably mounted in said body for engaging said take-up member when the same is in extreme take-up position to securely hold and lock the same.

2. A take-up latch mechanism adapted to engage a fixed catch on one of a pair of hinged casing sections, said take-up latch comprising a body member having longitudinal guiding means formed therein, a reciprocated take-up member shiftably mounted in said guiding means, a catch engaging latch element fixed at the outer end of said take-up member, a toothed rack fixed along one edge of said take-up member and having an enlarged recess formed at the end thereof nearest to said latch element, a rotatable pinion journaled in said body and having spaced teeth formed around only a portion of the periphery thereof intermeshed with the teeth of said rack, a locking cam formed around the remainder of the periphery of said pinion and positioned to engage the outermost tooth of the rack when the teeth of said pinion have ridden off therefrom and said cam has been received in the recess at the end of said rack, and means for controllably rotating said pinion.

3. The structure set forth in claim 2 and stop means associated with said latch mechanism for limiting the rotation of said pinion to substantially one complete revolution.

4. The structure set forth in claim 2 and resilient means for normally urging said take-up member into outwardly projected position to maintain engagement between the teeth of the rack and said pinion to cause meshing of the teeth of the pinion and the rack when said cam has passed out of engagement with the outer tooth of the rack.

5. A take-up latch mechanism adapted to engage a fixed catch on one of a pair of hinged casing sections, said take-up latch comprising a take-up member with a catch-engaging latch element at the outer end thereof, actuating means reciprocating said latch into and out of take-up position, locking means positively holding said member in take-up position, guiding means for said take-up member constructed and arranged to permit movement thereof in a plane generally normal to the direction of reciprocation of said take-up member, resilient means normally holding said take-up member in latching position but permitting the same to shift into a catch engaging position to produce a spring latch operation.

6. A rack and pinion take-up mechanism comprising a reciprocably mounted member, a rack carried by said member, a pinion having spaced teeth around only a portion of the periphery thereof to intermesh with the teeth of said rack, a locking cam formed in the remaining portion of the periphery of said pinion and engaging the tooth at the outer end of said rack when the teeth of said pinion have passed therebeyond to positively lock said reciprocated member in take-up position, and resilient means urging said take-up member outwardly into projected position to intermesh the teeth thereof with the teeth of said pinion when the cam has ridden out of engagement with said outermost rack tooth.

References Cited in the file of this patent

UNITED STATES PATENTS

383,549	Wolcott	May 29, 1888
1,290,462	Withall	Jan. 7, 1919
2,378,654	Pekny	June 19, 1945