(No Model.) 3 Sheets—Sheet 1.

I. W. HUCKINS.

STOP MOTION MECHANISM.

No. 454,739. Patented June 23, 1891.

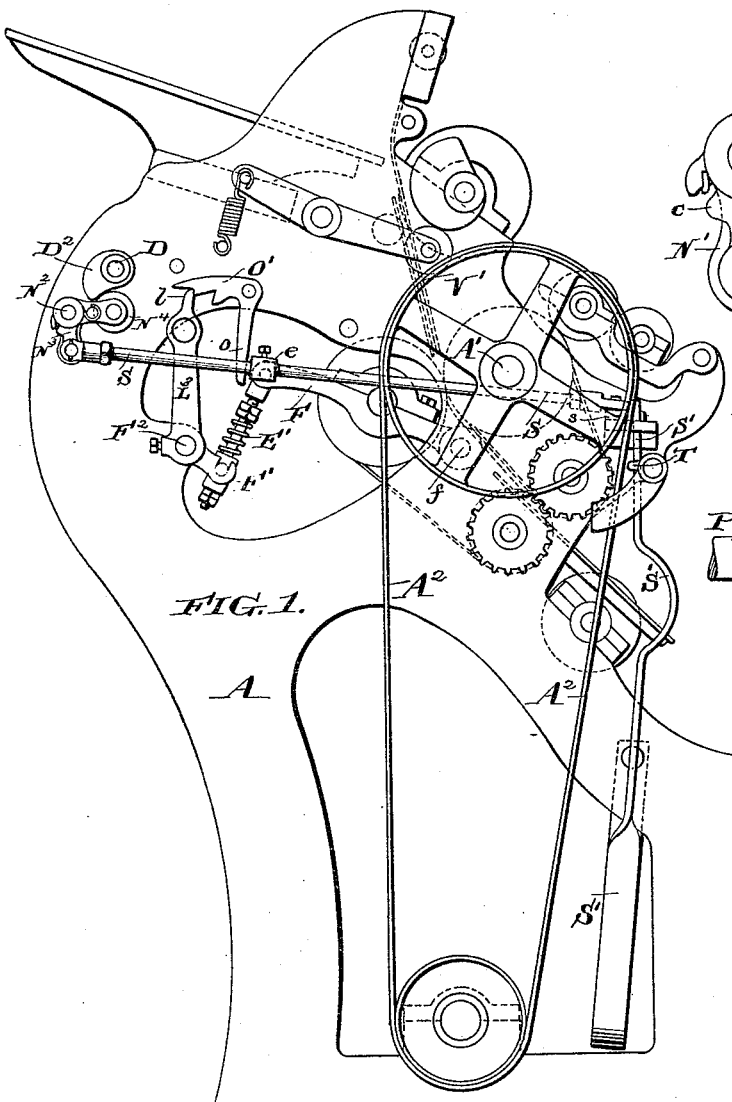


FIG. 1.

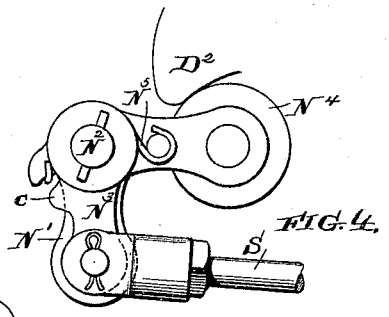


FIG. 4.

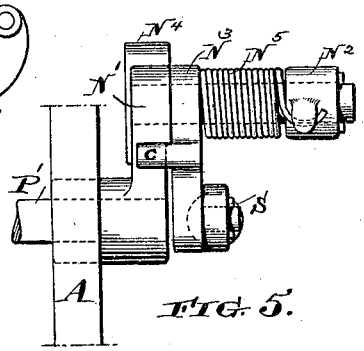


FIG. 5.

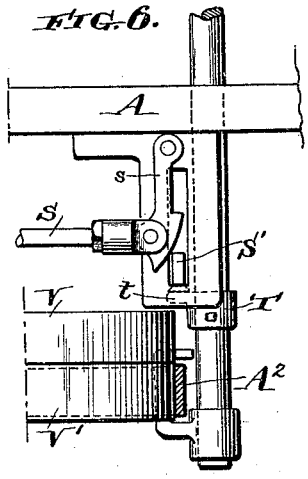


FIG. 6.

Witnesses:
Harry Drury

Inventor:
Irving W. Huckins
By his atty

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 3 Sheets—Sheet 2.

I. W. HUCKINS.

STOP MOTION MECHANISM.

No. 454,739. Patented June 23, 1891.

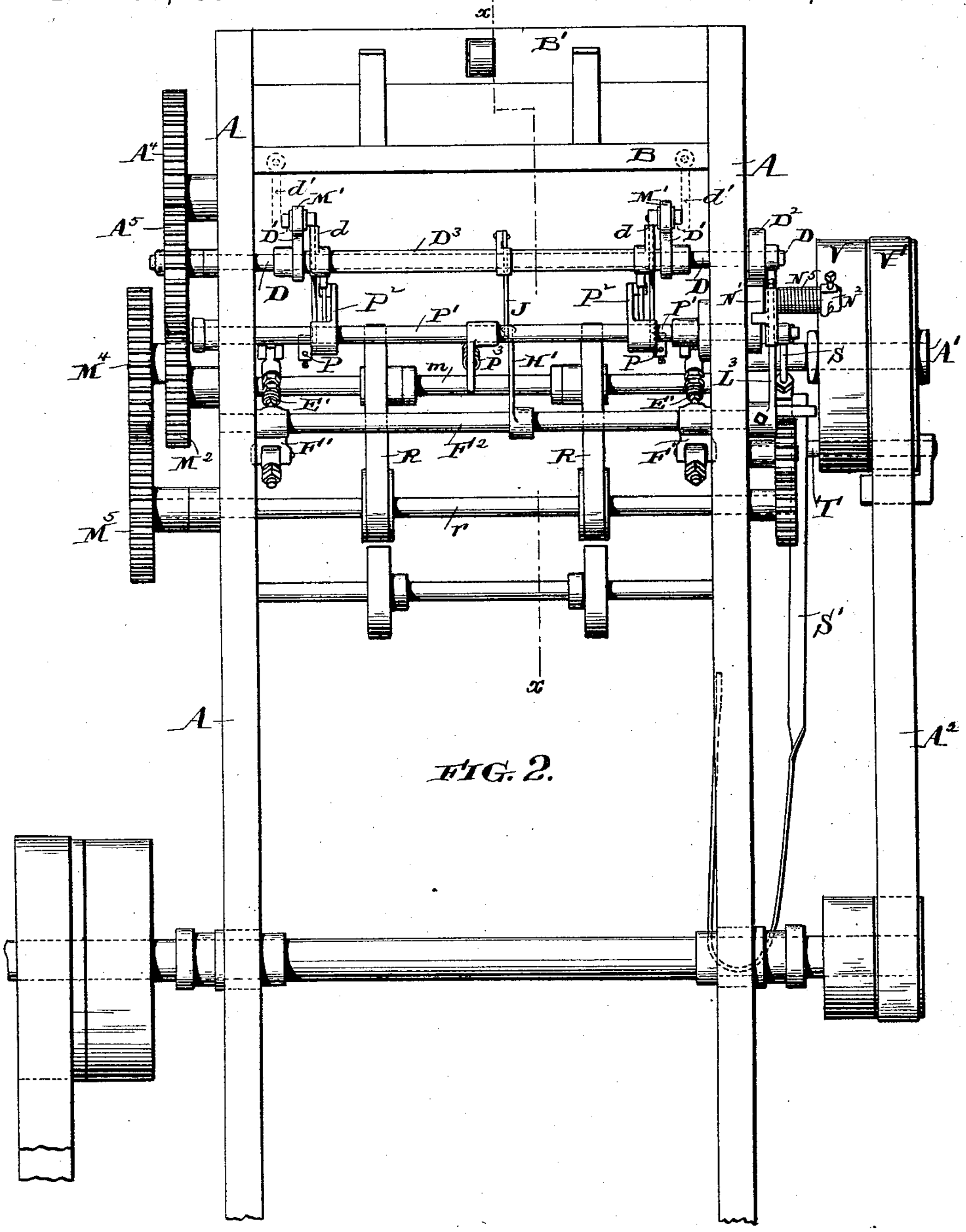


FIG. 2.

Witnesses:

Henry Drury

[signature]

Inventor:

Irving W. Huckins

By his atty

[signature]

(No Model.) 3 Sheets—Sheet 3.

I. W. HUCKINS.

STOP MOTION MECHANISM.

No. 454,739. Patented June 23, 1891.

FIG. 3.

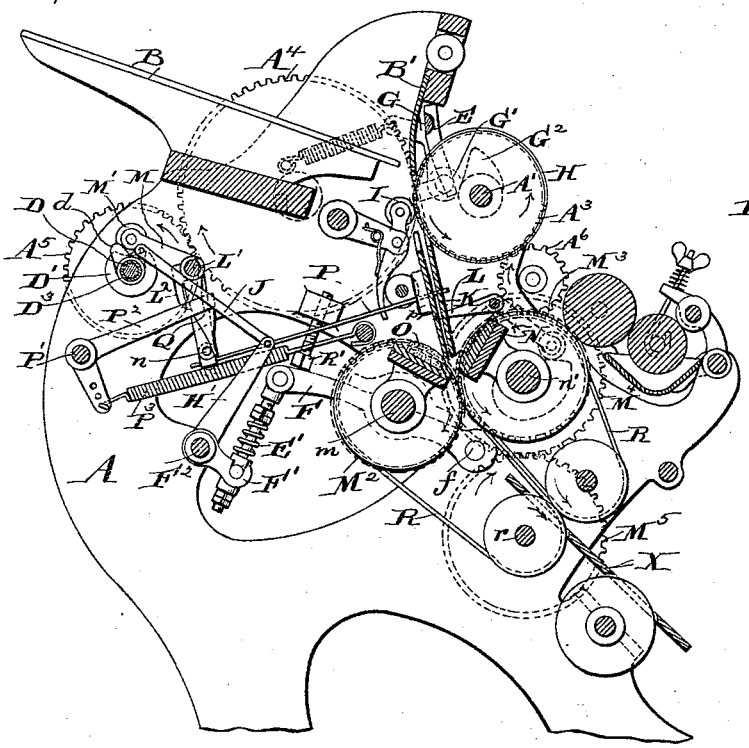


FIG. 7.

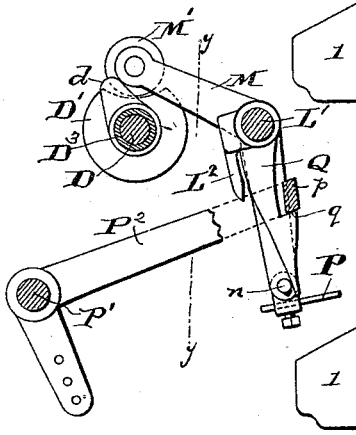


FIG. 9.

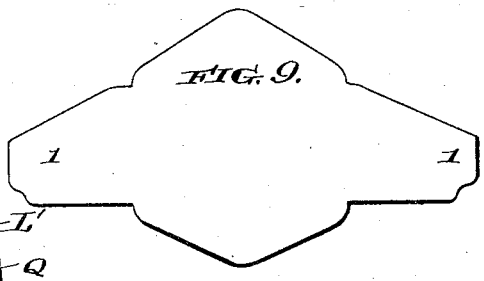


FIG. 10.

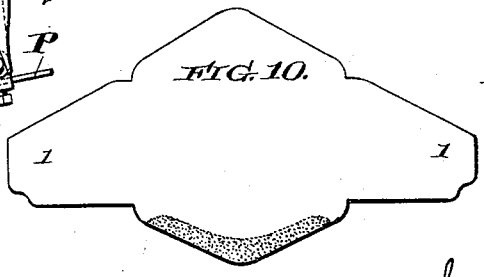
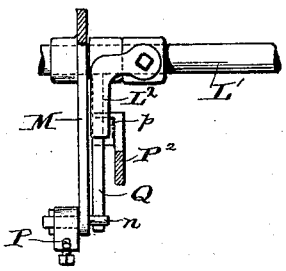


FIG. 8.



Witnesses:

Henry Bruce

Inventor:

Irving W. Huckins

By his atty

[illegible]

UNITED STATES PATENT OFFICE.

IRVING W. HUCKINS, OF PHILADELPHIA, PENNSYLVANIA.

STOP-MOTION MECHANISM.

SPECIFICATION forming part of Letters Patent No. 454,739, dated June 23, 1891.

Application filed February 18, 1891. Serial No. 381,799. (No model.)

To all whom it may concern:

Be it known that I, IRVING W. HUCKINS, of the city and county of Philadelphia, and State of Pennsylvania, have invented an Improvement in Stop-Motion Mechanism, of which the following is a specification.

My invention relates to stop-motion mechanism; and it consists of certain improvements, which are fully set forth in the following specification, and are shown in the accompanying drawings, which form part thereof.

My improved stop-motion is more particularly adapted to rotary envelope gumming or printing machines, and in the drawings and the description thereof in the specification I show and describe it as applied to an envelope-gumming machine such as is disclosed in Letters Patent of the United States No. 434,446, granted to me on the 19th day of August, 1890. In a machine of this character in which the blanks to be treated are fed between a rotary form for applying a liquid substance—such as mucilage or ink—to the blank and a backing or supporting form, it is especially necessary that a promptly-acting stop-motion should be employed to instantly stop the operation of the machine if the feeding of the blank should for any cause be interrupted. Otherwise upon a failure of a blank to pass between the two forms the mucilage or ink applying surface would come directly in contact with the surface of the backing-form and would impart mucilage or ink thereto, which would be communicated thereby to the subsequent blanks and would materially interrupt the proper operation of the machine, ruining the blanks and causing them to adhere to the backing-form. My invention is intended to prevent such accidents by providing the machine with an automatic stop-motion, which shall operate instantly upon any interruption of the feeding of the blanks to throw the machine out of operation. The construction and operation of the apparatus by which this result is accomplished are fully set forth hereinafter.

In the drawings, Figure 1 is a side elevation of an envelope-gumming machine such as is set out in Letters Patent No. 434,446, heretofore referred to, having my improved stop-motion applied thereto. Fig. 2 is an end elevation of the same with the feeding and gumming devices removed. Fig. 3 is a vertical sectional view of the upper portion of the same on the line $x\ x$ of Fig. 2. Fig. 4 is an end elevation, on an enlarged scale, of the cam-actuated devices for operating the shifting-rod. Fig. 5 is a side elevation of the same. Fig. 6 is a plan view, on an enlarged scale, of the belt-shifting bolt and the devices for actuating it. Fig. 7 is an enlarged view of a portion of the operative mechanism shown in Fig. 3. Fig. 8 is a vertical sectional view on the line $y\ y$ of Fig. 7; and Figs. 9 and 10 are plan views of the envelope-blank, respectively, before and after the mucilage has been applied to the flap thereof.

A is the main frame of the machine.

B is the feeding table or support from which the blanks are fed.

B′ is an end support for the upper part of the blanks, to hold them in an upright position on the table B.

E is the suction-separator for separating the successive blanks operated by the cam G^2 through the arm G and roller G′. (Shown in dotted lines in Fig. 3.)

H is a feeding-roller upon the shaft A′.

I is the small feeding-roller moving in contact therewith, between which and the roller H the blank is fed through the guides K to the paste-applying form N and the backing-form O.

L are stop-fingers for temporarily arresting each blank successively in its passage between the guides $k\ k$.

R R are the carriers for conducting the gummed blanks to the guide X, whence they are fed to the drying or packing devices.

The foregoing parts of the machine are fully shown and described in my Letters Patent No. 434,446, heretofore referred to. While the present invention is shown applied to this particular machine, it is equally adapted to other machines of the same general character, as heretofore set forth.

I will refer now to the stop-motion mechanism and its connection with the foregoing devices.

D is a shaft journaled in the main frame A and carrying cams D′ D′. This shaft D is also provided with another cam D^2, by which the shifting-rod is operated, as is hereinafter more fully set forth.

F are arms pivoted to the main frame, as at *f*, and provided with bearings in which the shaft *m*, carrying the backing-form O, is journaled.

F^2 is a rock-shaft journaled in the frame A and provided with supports F′. The arms F are supported by the supports F′, preferably through intermediate spring-supporting rods E′, pivoted to the arms F and resting upon the supports F′.

H′ is a lever carried by the rock-shaft F^2.

D^3 is a sleeve upon the shaft D, provided with locking projections *d d*, located adjacent to the cams D′ D′ upon the shaft D.

J is a link connecting the lever H′ with the sleeve D^3.

It will be seen that any movement of the rock-shaft F^2, for the purpose of raising or lowering the shaft *m* of the form O, will produce a corresponding rocking of the sleeve D^3 and its projections *d d*.

L′ is a fixed shaft in the frame A adjacent to the shaft D. Journaled upon this shaft L′ are frames or bell-cranks M, carrying upon one member rollers M′, adapted to rest in contact with the cams D′. Carried by the other member of each frame or bell-crank M are needles P, adapted to pass through holes in the guide-plates K. The inner guide-plate may be provided with guiding-blocks *p′* for the ends of the needles, Fig. 3. When the rollers M′ are held in their highest position by the cams D′, the ends of the needles P P do not pass through the space between the guide-plates K; but when the rollers M′ are allowed to drop into the depressions in the cams D′ the needles will be projected forward and will pass through the plates K K. Journaled upon the shaft L′, immediately adjacent to each frame or bell-crank M, is a pawl or pendant Q, having a hook *q*. The lower ends of the frames or bell-crank M are provided with pins *n*, adapted to strike the ends of the hooked pawls or pendants Q and swing them forward when the bell-cranks are rocked.

L^2 are stops carried by the shaft L′ to normally hold the pawls Q from contact with the pins *n*, except when the pins are moved forward sufficiently, as heretofore described, to operate the stop motion.

P′ is a rock-shaft journaled in the frame A, carrying arms P^2, which are provided with ends *p*, arranged adjacent to the pawls Q, so that when the pawls Q are moved forward in the manner heretofore described, the hooks *q* thereof will be brought in the paths of these ends *p* of the arms P^2, thereby locking the arms P^2 and the rock-shaft P′ against movement.

P^3 is a spring connected with the rock-shaft P′ to return it to its normal position when rocked.

Upon the end of the rock-shaft P′ is an arm N′, carrying a stud N^2.

N^3 is a bell-crank journaled upon the stud N^2 and carrying upon one arm a roller N^4, which is operated upon by the cam D^2.

N^5 is a spring between the stud N^2 and the bell-crank N^3. The bell-crank N^3 is provided with a pin *c* to hold it in position with reference to the arm N′ against the action of the spring N^5. The bell-crank N^3 is normally prevented from moving by the action of the spring N^5, so that the cam D^2, acting through the bell-crank N^3 upon the arm N′, will rock the shaft P′. When, however, the rock-shaft P is locked against movement, the cam D^2 will overcome the tension of the spring N^5 and rock the bell-crank N^3 upon the stud N^2. The parts N′ and N^3, with the spring N^5, thus constitute a movable part having a movable fulcrum N^2, which is normally moved by the cam D^2, the movable part rocking with the shaft P′.

S is a shifting-rod pivoted at one end to the bell-crank N^3 and having its other end connected with a lock *s*. (See Fig. 6.) This rod S is connected with the movable part, which normally rocks on the point of connection between the bell-crank N^3 and the rod S as a fulcrum, without producing any movement in the rod.

S′ is a spring acting against a projection *t* upon a belt-shifting bolt T, movable in the main frame A.

V and V′ are, respectively, the fast and loose pulleys on the driving-shaft A′, and A^2 is the driving-belt.

The spring S′ is normally held out of action by the lock *s*, but when the lock is withdrawn by the shifting-rod S it acts upon the bolt T. The movement of the bolt T shifts the belt A^2 from the fast pulley V to the loose pulley V′. These devices, operated by the rod S, are of a character well known, and their particular details are immaterial to my invention.

L^3 is a lever carried by the shaft F^2, having its end I adapted for engagement with a pivoted lock O′. By this means the shaft F^2 is held against movement, and the shaft *m*, which is supported thereby in the manner heretofore described, is held in its raised position. The lock O′ is provided with a leg *o* in the path of a stop *e* upon the shifting-rod S. When the rod S is shifted, this stop *e* strikes the leg *o* and moves the lock O′, so as to release the lever L^3 and to permit the shaft F^2 to rock and the shaft *m* to drop. This operation drops the form O away from the form N. Power is imparted from the driving-shaft A′, through the gear A^3 thereon and the intermediate gear A^4, to the gear A^5 upon the shaft D. Power is also transmitted from the shaft A′, through the intermediate gear A^6, to the gear-wheels M^2 and M^3 upon the shafts *m* and *n′*, which carry the forms O and N, respectively. The slight movement of the shaft *m* need not be sufficient to break the gearing connection between the wheels M^2 and M^3, the teeth of which may be made of sufficient depth to permit the small movement of the shaft *m* to move the form O out of contact with the form N without moving the teeth of the gear-wheels out of engagement. The shaft *n′* carries a second gear-wheel M^4, by which

power is transmitted to the gear M^5 and the shaft r, which drives the carriers R. R′ is a stop to limit the upward movement of the arms F.

While I prefer the details of construction which have been shown, it is apparent that they may be varied without departing from my invention.

I will now describe the operations of the machine. Considering the lever L^3 locked in the position shown in Fig. 1, and the spring S′ held out of operation by the lock *s*, and the band A^2 upon the fast pulley V, the machine is then running and the blanks are successively fed from the table B, between the rollers H and I, through the guides K K, and between the forms O and N, where they are pasted or printed, as the case may be. During this operation the shaft D is rotated and the projections *d* upon the sleeve D^3 are turned away from the rollers M′, as shown in Figs. 3 and 7, allowing them to run in contact with the cams D′. Normally the cams D′ hold the frames M in a raised position with the needles P at the openings in the plates K unobstructing the passage of the blanks between the plates. The moment, however, when the depressions in the cams are reached the rollers M′ tend to drop into the depressions and thereby rock the frames M and project the pins P P through the holes. At this moment, however, a blank in passing between the guides K K is temporarily arrested by the stop-fingers L L, and the side flaps *l l* Figs. 9 and 10, thereof are in a position adjacent to the holes. The ends of the pins P P thus strike the flaps *l l* and are prevented from passing through the guide-plates K K. By this means the frames M are sustained in their normal position with the rollers M′ held out of the cam depressions, and the stop-motion mechanism is not operated. By the time the sustaining-blank has moved from the guide K K the depressions in the cams D′ D′ have passed from under the rollers M′, and the rollers are held by the cams until the next blank is in position between the guides K K. Thus each blank as it passes between the guides K K for an instant sustains the frames M, while the depressions in the cams pass under the rollers M′, and this action continues for so long as the feeding of the blanks is constant. During this continuous action there is no operation of the stop-motion mechanism. During this operation the cam D^2 is constantly rotating, and striking the roller N^4 upon the bell-crank N^3. It rocks the shaft P′, as has heretofore been described, through the action of the spring N^5, connecting the bell-crank N^3 and the arm of the shaft P′. This rocking of the shaft P′ rocks the lever P^2, the end of which is free to pass over the pawl Q, while the pawl remains in its normal position. There is consequently no operation of the stop-motion mechanism. If now at any moment there is an interruption in the feeding of the blanks, (which would result in the two forms N and O coming together,) the pins P P are free to pass through the guiding-plate K, since there is no blank to obstruct them, and the rollers M′ drop into the depression in the cams D′ D′ and swing the frames M M into the position shown in Fig. 7. This movement of the frame M, as has been heretofore described, moves the pawls Q until their hooks *q* are in line with the ends *p* of the levers P^2, and locks the levers P^2 and their shaft P′ against rocking. The frame M, with the pawls Q and the cams D′, thus constitute a lock, acting upon the levers P^2 to lock the arm N′ against movement, and thus also to lock the movable fulcrum between the arm N′ and the bell-crank N^3. When the shaft P′ is thus locked, the cam D^2 overcomes the action of the spring N^5 and rocks the bell-crank N^3 upon the stud N^2. The bell-crank N^3, when thus rocked, shifts the rod S and causes the belt A^2 to be shifted from the fast pulley V to the loose pulley V′, as has been heretofore fully set out, and thereby the machine is brought to a standstill. As the rod S is shifted, in the manner described, the stop *e* strikes the leg *o* of the lock O′, which releases the lever L^3 and permits the shaft *m* to drop and thus bring the form O away from the form N. The rocking of the shaft F^2, through the lever H′ and link J, turns the sleeve D^3 upon the shaft D and brings the projections *d d* under the ends of the bell-cranks M′, supporting them in a raised position and thus permanently locking the stop-motion out of operation independently of the action of the blanks upon the needles P P. Thus while the shaft *m* is lowered, so that the form O will not come in contact with the form N, the machinery may be put into operation for any desired purpose without the operation of the stop-motion, which, as has heretofore been stated, is locked out of operation by the projections *d d*. Obviously no harm can be done by the rotation of the machinery at such a time, as the form N cannot communicate the paste or ink to the form O. If desired, this locking of the stop-motion by the locking-projections *d d*, or their equivalents, may be accomplished independently of the movement of the shaft *m*, by dispensing with any connection between the shaft F^2 and the projections *d d*, or independent supporting-hooks *d′ d′* may be employed, as shown in dotted lines in Fig. 2, which may be used to support the rollers M′ in a manner similar to the projections *d d*; but the construction shown is much preferable, as it is desirable that the stop-motion shall always be thrown into operative connection with the other parts of the machine the instant the shaft *m* is in a position to bring the forms N and O in contact. It is also desirable that the dropping of the shaft *m* should take place automatically with this stopping of the machine, though this may be done independently also, if desired, by removing the stop *e* so that it will not strike the leg *o*. To start the machine and put the stop-motion again in operative connection,

the lever L^3 is raised and locked by the lock O′, and the bolt T is pushed back to bring the spring S′ behind the lock *s*, and the belt A^2 upon the fast pulley V.

Having now described my invention, what I claim as new, and desire to obtain by Letters Patent, is—

1. In a stop-motion, the combination, with a power-driven machine, of a shifting-rod and the devices operated thereby, a movable part connected with said shifting-rod and having a movable fulcrum independent of the connection with the shifting-rod, a cam to rock said movable part and its fulcrum without moving the shifting-rod, a lock to lock said movable fulcrum, whereby said movable part is caused to rock upon its said fulcrum and actuate the shifting-rod, and connecting mechanism for operating said lock, controlled by the article as it is being fed through the power-driven mechanism.

2. In a stop-motion, the combination, with a power-driven machine, of a shifting-rod and the devices operated thereby, a movable part fulcrumed to said shifting-rod and having a second movable fulcrum, a cam to normally rock said movable part upon its fulcrum with the shifting-rod, whereby the shifting-rod is not moved, a lock to lock said second movable fulcrum against movement, whereby the movable part is locked upon said second fulcrum and this first fulcrum and the shifting-rod is moved, and connecting devices to actuate said lock, controlled by the passage of the article under treatment through the machine.

3. In a stop-motion, the combination of rotary power devices, substantially as described, feeding mechanism to feed articles one at a time through said power devices, a shifting-rod and the devices operated by it, a movable part consisting of a rocking arm N′, bell-crank N^3 fulcrumed thereto, and spring N^5 between said rocking arm and bell-crank, said bell-crank being connected with the shifting-rod, a cam to rock said bell-crank and rocking arm, a lock to lock said rocking arm against movement, whereby the bell-crank will be rocked upon the arm, and connecting mechanism to actuate said lock, controlled by the article in passing through the machine.

4. In a stop-motion, the combination of a power-driven machine, substantially as described, with a shifting-rod and the devices operated thereby, a movable part connected with said shifting-rod and having a movable fulcrum independent of the connection with the shifting-rod, a cam to rock said movable part and its fulcrum without moving the shifting-rod, a lock to lock said movable fulcrum, having a locking-pawl, and cam mechanism to actuate the locking-pawl, connecting mechanism to control the action of said cam mechanism, controlled by the article in being fed through the machine, whereby when no article is present the cam mechanism is allowed to operate to throw the locking-pawl into action and thereby lock the movable fulcrum.

5. In a stop-motion, the combination of a power-driven machine, substantially as described, with a shifting-rod and the devices operated thereby, a movable part connected with said shifting-rod and having a movable fulcrum independent of the connection with the shifting-rod, a cam to rock said movable part and its fulcrum without moving the shifting-rod, a lock to lock said movable fulcrum, consisting of a frame, a locking-pawl carried by said frame and moved with it into operative position to act upon the movable fulcrum, cam mechanism to actuate said frame, and connecting mechanism to normally hold said frame out of operative connection with said cam, controlled by the article in its passage through the machine.

6. In a stop-motion, the combination of a power-driven machine, substantially as described, with a shifting-rod and the devices operated thereby, a movable part connected with said shifting-rod and having a movable fulcrum independent of the connection with the shifting-rod, a cam to rock said movable part and its fulcrum without moving the shifting-rod, a lock to lock said movable fulcrum, consisting of a frame, a locking-pawl carried by said frame and moved with it into operative position to act upon the movable fulcrum, cam mechanism to actuate said frame, and connecting mechanism to normally hold said frame out of operative connection with said cam, controlled by the article in its passage through the machine, and a lock to lock said frame permanently out of action independently of said connecting mechanism controlled by the article being fed.

7. In a stop-motion, the combination of a power-driven machine provided with feeding devices for feeding blanks successively through the said machine, and with a guide through which the said blanks are fed, a shifting-rod and devices operated thereby for shifting the driving-belt of the machine, a movable part connected with said shifting-rod and having a movable fulcrum independent of the connection of said movable part with the shifting-rod, a cam to rock said movable part and its said movable fulcrum without actuating the shifting-rod, and arm P^2, carried by and moving with the said movable part, a pivoted frame M, and cam D′ for operating said pivoted frame, a locking-pawl Q, carried by said movable frame and moved with it into engagement with the arm P^2, and a needle P, projecting into said guide through which the article passes and controlled by the article to sustain said frame M and prevent its actuation by the cam D′.

8. In a stop-motion, the combination of a power-driven machine having rotary form-carrying shafts *m n′* and provided with a guide for a series of blanks and feeding devices to feed the blanks successively through the guide, a support for the shaft *m*, whereby

it may be moved to or from the shaft n', a shifting-rod and devices operated thereby for shifting the driving-belt of the machine, a movable part connected with said shifting-rod and having a movable fulcrum independent of the connection of said movable part with the shifting-rod, a cam to rock said movable part and its said movable fulcrum without actuating the shifting-rod, and arm P^2, carried by and moving with said movable part, a pivoted frame M, a cam D′ for operating said pivoted frame, a locking-pawl Q, carried by said movable frame and moved with it into engagement with the arm P^2, and a needle P, projecting into said guide through which the article passes and controlled by the article to sustain said frame M and prevent its actuation by the cam D′, a lock to lock the frame M permanently out of action with the cam D′, and a connection between said lock and the support for the shaft m.

In testimony of which invention I have hereunto set my hand.

IRVING W. HUCKINS.

Witnesses:
ERNEST HOWARD HUNTER,
JOHN A. BRAMLEY.