June 8, 1937. F. W. STORCK 2,083,044

COMBINED CLAMP RELEASE AND MOTION STOP FOR DUPLICATORS

Filed July 2, 1936 2 Sheets-Sheet 1

Fig. 1.

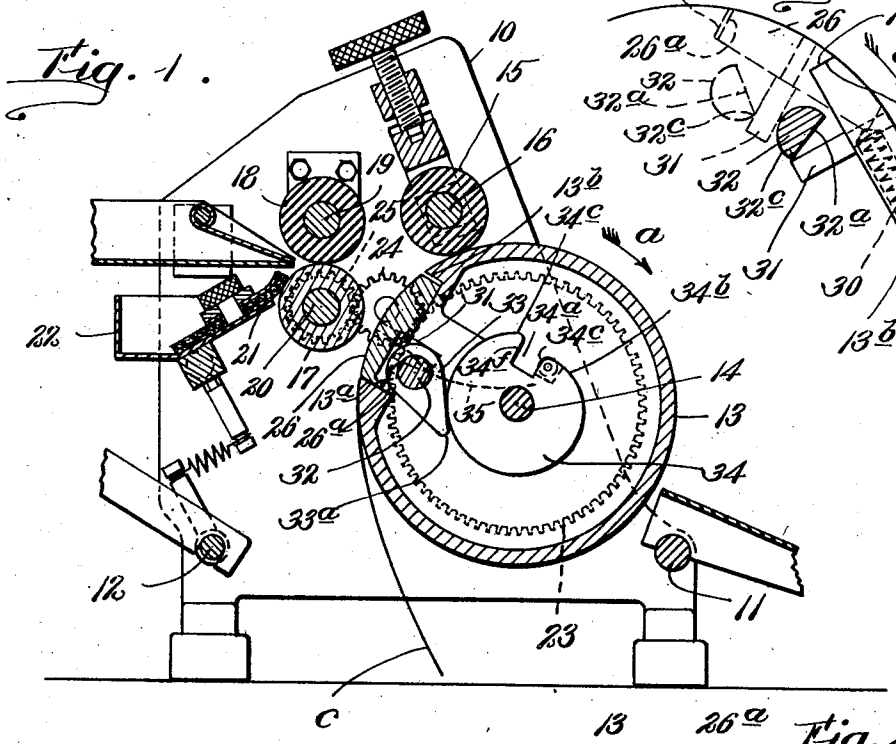

Fig. 7.

Fig. 2.

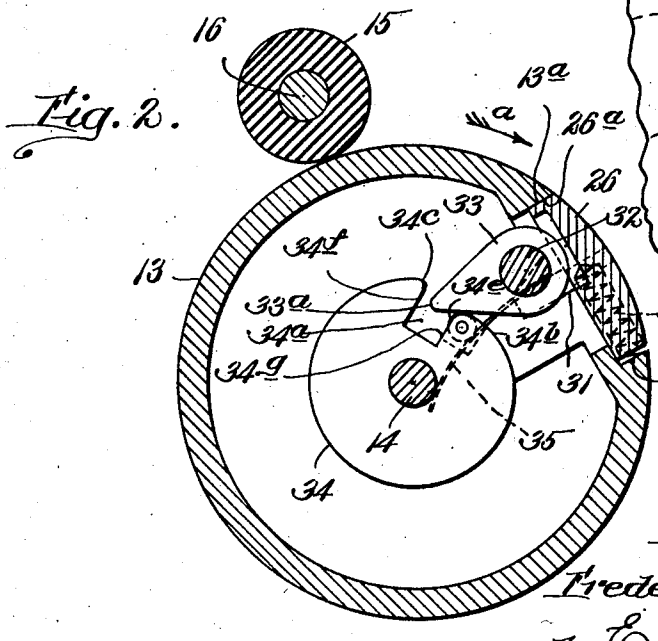

Fig. 4.

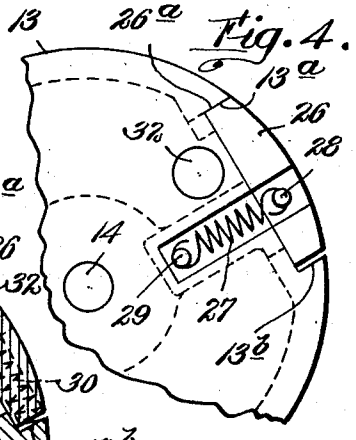

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Fig. 3.

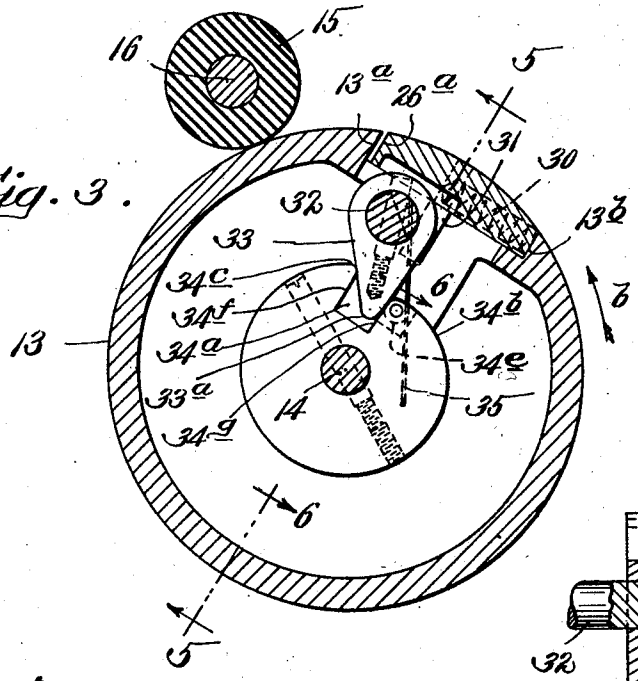


Fig. 6.

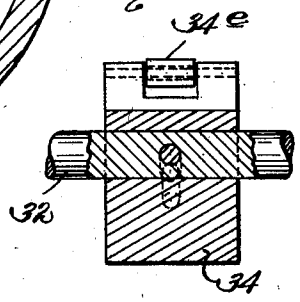
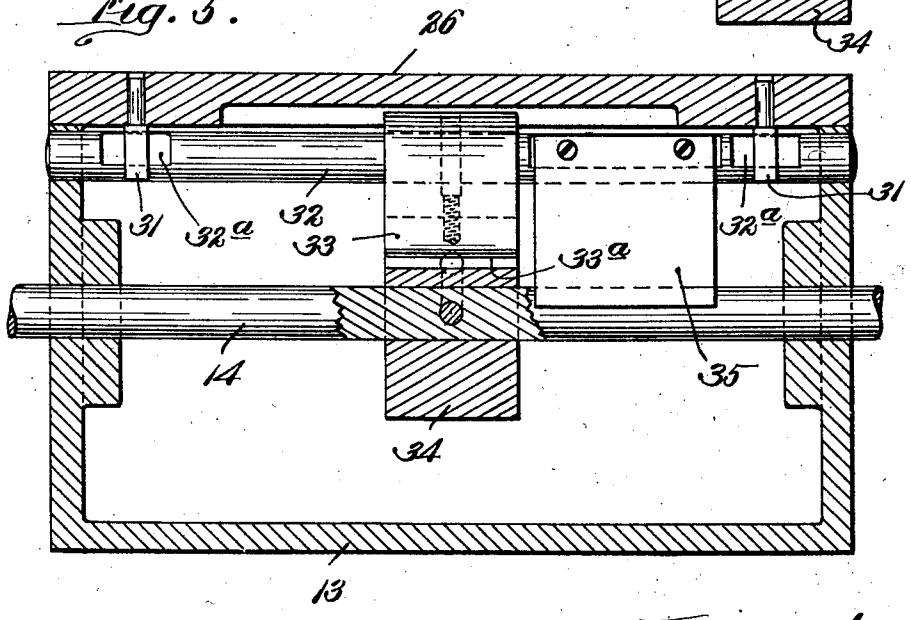


Fig. 5.



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UNITED STATES PATENT OFFICE

2,083,044

COMBINED CLAMP RELEASE AND MOTION STOP FOR DUPLICATORS

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Application July 2, 1936, Serial No. 88,568

5 Claims. (Cl. 101—132)

This invention relates to rotary duplicators of the type having a printing cylinder or platen which is provided with a clamping device adapted to secure a master copy sheet to the face of the platen, and the printing platen is further provided with a determinate stopping and starting point for each cycle of operation and the invention more particularly relates to a combined automatic clamp actuating device and reverse motion stop which is effective to stop the platen in a determinate position other than its normal operative stopping and starting point and effective only when the platen is rotated contra to its normal direction of operative rotation.

In duplicators of the herein referred to character, the end of the master copy sheet is secured to the printing platen and the normal stopping point of the platen arranged relative to a bight, formed by the platen and a coacting pressure roller, so that clear sheets to be duplicated upon may be fed into said bight to register in engagement with the master copy upon subsequent rotation of the platen and the master matter duplicated upon the clear sheet. A duplicating machine of this referred to character is fully shown and described in my U. S. Letters Patent Re. No. 19,951.

Accomplishment of the desired function of feeding the clear sheets for registering engagement with the master copy requires an arrangement of the machine elements that will effect a stopping point for the clamped end of the master close to the path of the advancing end of the clear sheet to be duplicated upon so as to register with the master with a minimum unused end margin. This requires that the clamped end of the master and the advancing front end of the clear sheet register for engagement in the aforesaid bight formed by the printing platen and pressure roller. In arranging the machine elements to obtain the desired duplicating function in an efficient and desired sequence, the aforesaid normal operating position of the master clamp is either in an inaccessible position or in a position which does not readily lend itself for the purpose of conveniently and properly attaching the master copy or removing the same from its clamp without interference.

When the master copy is to be attached or removed, in duplicating machines having these aforementioned elements and so arranged, the operator rotates the drum until the clamp is in an exposed or desired position with the master copy free from contact with the pressure roller. In performing this positioning operation, the platen is usually rotated contra to its normal direction of operative rotation and its stopping point controlled manually by the operator, therefore, care and particular attention must be exercised by the operator to stop the clamping device in the desired or exposed position. This positioning operation is further inconvenienced when the duplicator is operated by motor or like power and at a relatively high speed. Under these circumstances, unless the operator is alert, the platen will continue rotating until it is again engaged in its normal stop position.

It is obvious that speed, convenience and simplicity in operation are of vital importance in duplicating machines of this referred to character.

Accordingly, a primary object of my invention is to provide a simple and efficient stop for a duplicator and which is contained wholly within the printing platen or drum and thus eliminates outward rotating projections or extensions.

Another object of my invention is to provide a combined automatic stop and clamp release which is effective to arrest rotary movement of the printing platen or drum in one direction only and at a point other than its operating cycle stopping point, and whereby the clamp is simultaneously opened in a convenient position to permit the removal and insertion of the master copy sheet.

A still further object of my invention is, to provide a combined duplicator platen stop and clamp opening device of a rugged construction and with a minimum number of working parts.

With the above and other apparent objects in view, my invention comprises a novel combination and arrangement of parts hereinafter described and more specifically pointed out in the appended claims.

In the accompanying drawings I have illustrated a preferred form of my combined automatic stop and clamp actuating device, embodied with a portion of a rotary duplicator, sufficient to enable those skilled in the art to understand the construction and operation thereof.

Referring to the drawings:

Fig. 1 is a transverse section of a duplicator having my improvements embodied therewith.

Fig. 2 is a detached, enlarged transverse section of the duplicator platen or drum and its coacting pressure roller.

Fig. 3 is a view corresponding substantially to Fig. 2, but shows the parts in a different position.

Fig. 4 is a fragmentary view of one end of the printing platen or drum.

Fig. 5 is a sectional view taken substantially along line 5—5, Fig. 3.

Fig. 6 is a sectional view taken substantially along line 6—6, Fig. 3, and

Fig. 7 is substantially a diagrammatical view showing the comparative positions of the master clamp as illustrated at Figs. 2 and 3.

The duplicating machine

The duplicating machine, of which a portion only is illustrated, is provided with opposed side frames 10, only one of which is shown. The frames are retained in a spaced relation by suitable cross members such as illustrated at 11 and 12.

The printing platen or drum 13 is rotatably mounted upon a shaft 14 which, in turn, is secured against rotation in suitable bearings in the side frames.

A pressure roller 15 engages the peripheral face of the platen 13 and is mounted upon a shaft 16 which is journalled at its ends in suitable bearings in the side frames.

The feed rollers 17, 18 are each provided with shafts 19, 20 which are rotatably supported in suitable bearings. In this instance, the roller 17 is utilized as an intermediate moisture applicator which is supplied with moisture by a wick 21 which engages with fluid contained in the tank 22.

The printing platen is rotated by suitable mechanism, not shown, to effect a determinate positioned stop or dwell period in its cycle of rotation. The duplicator parts are illustrated at Fig. 1 in this referred to stop or dwell position. A drive gear 23 is secured in relation to the printing platen 13 and is rotated therewith. This drive gear 23 meshes with an intermediate gear 24 which, in turn, meshes with a pinion 25 which rotates the feed roller 17 and thus the feed rollers 17, 18 are rotated in a direct relation to the printing platen.

The master copy sheet clamp

The periphery of the printing platen 13 is provided with a recess which extends longitudinally thereof and is adapted to receive and support a clamp bar 26. The outer face of the clamp bar 26 conforms to the contour of the platen face and forms a part thereof. This bar 26 is of less width than the drum recess and is adapted for a transverse sliding movement within the platen recess. The bar 26 is retained seated in the platen recess by means of springs 27 disposed in recesses in the opposed end faces of the platen. A fragmentary view of one end of the platen with the clamp bar 26 attached thereto by means of the springs 27 is illustrated at Fig. 4. The opposite end of the clamp bar is secured to the platen in a like manner, one end of the spring 27 is attached to a stud 28 fixed in the end of the clamp bar and the opposed end of said spring attached to a stud 29 fixed in the platen end.

The side wall 26*a* of the clamp bar 26 is urged toward and against the side wall 13*a* of the platen recess by means of compression springs 30 disposed in bores in the clamp bar, the inner ends of said springs having their bearings against the bottom of the bores and their opposed ends bearing against the side wall 13*b* of the platen recess.

In this instance, the clamp bar 26 is provided with projections 31 which extend into the drum. These projections 31 are adapted to be engaged by a cam element which, as illustrated, is in the form of a rod 32 rotatably supported within the drum. This rod is cut away as at 32*a* to form a substantially straight face and which is disposed opposite to the clamp bar projections 31. Rotation of the rod 32 causes the high part thereof to bear against the projections 31 and continued rotation of the rod will cause the bar 26 to compress the springs 30 and thus separate the clamping walls 13*a* and 26*a* as illustrated at Fig. 3.

A duplicating machine and clamping device of the above description are completely shown and described in my aforementioned Letters Patent Re. No. 19,951, therefore, further detailed description is thought unnecessary as the important elements thereof will be further mentioned in connection with my improvements.

The combined automatic reverse motion stop and clamp opening device

Secured to the cam rod 32 is a cam follower 33 which engages with a stationary cam 34 secured to the stationary shaft 14 which rotatably supports the printing platen 13. The cam follower 33 is retained in close engagement with the periphery of the cam 34 by means of a flat spring 35 which, in this instance, is secured to the rod 32 and has a bearing against the shaft 14. In my preferred illustrated form, the peripheral face of the cam 34 is provided with a notch 34*a* for a purpose hereinafter described.

Rotation of printing platen during duplicating operation

The edge of the master copy sheet C, which is clamped between the platen wall 13*a* and the clamp bar wall 26*a* and in its normal position, to begin a cycle of operation, is depending as shown at Fig. 1.

The clear sheet to be duplicated upon is positioned in the bight of the feed rollers 17, 18 and the printing platen 13 is then rotated in the direction of arrow *a* and, through the gearing connections 23, 24, 25, the feed rollers advance the clear sheet for registering engagement with the master copy under pressure exerted by the roller 15. As the printing platen 13 is rotated in its normal direction for duplicating, as indicated by arrow *a*, the cam follower 32 rides around the cam 34 and in engagement with the peripheral face thereof. As will be noted, the face of the cam 34 is provided with a low area 34*b*, adjacent one wall of the notch 34*a*, and is inclined to the greater diameter of the cam which terminates at 34*c* and connects with the wall 34*f* of the notch 34*a*. I have provided a bumper 34*e* which, in this instance, is in the form of a resilient roller rotatably supported adjacent the cam face and notch 34*a*. This bumper 34*e* prevents undue noise or slap as the cam follower 33 drops from the high surface to the low surface of the cam face adjacent the cam notch 34*a*.

During normal rotation of the printing platen 13, the rod 32 receives a slight oscillating movement but which is ineffective to engage the clamp bar projections, due to the clearance provided by the cut-away portions 32*a* of the rod 32 and which are disposed opposite to the cam projections.

Operation of combined reverse motion stop and clamp opening device

To position the master copy clamp for con-

veniently removing or replacing the master copy sheet, the printing platen is rotated contra to its normal operative direction as indicated by arrow *b*, Fig. 3. The cam follower **33** rides on the depressed area **34***b* of the cam until the end **33***a* abuts against the notch wall **34***f* and continued rotation of the platen causes the cam follower end **33***a* to enter the notch and engage with the opposite notch wall **34***g* and thereby wedging the cam follower **33** in the cam notch **34***a*, see Fig. 3.

During the rotative movement of the cam follower **33**, in the cam notch **34***a*, the rod **32**, to which the follower is secured, is rotated therewith and the cam point **32***c* of the rod **32** engages with the clamp bar projections **31** and forces the bar **26** to slide in its recess against the action of the bar springs **30** and thus causing the clamp walls **13***a*, **26***a* to separate, see Figs. 3 and 7, so that the edge of the master copy sheet may be readily and conveniently removed or replaced.

While the clamp is in this open position, the edge of the master copy sheet may be inserted between the clamping walls and against the bottom of the platen recess; the platen is then rotated in its normal direction, indicated by arrow *a*. As the cam follower **33** disengages from the cam notch, see Fig. 2, the clamp bar projections **31** are disengaged from their contact with the cam rod **32** and the springs **30** again slide the bar into engaging position with the edge of the master copy sheet clamped between the walls **13***a*, **26***a*.

While I have shown and described a preferred embodiment of my invention, it is to be understood that this is for the purpose of illustration only as my device is capable of many modifications and varied applications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention, as disclosed in the appended claims, in which it is my intention to claim all novelty inherent in my invention as broadly as possible, in view of the prior art.

Having thus described my invention, what I claim is:

1. A rotary duplicator of the character described having a rotatable printing platen and means for rotating said platen in opposite directions, a yielding clamp member for securing a master copy sheet to said platen, an extension associated with said clamp and positioned within said platen, an element within said platen which is adapted to engage with said extension, a fixed member disposed within said platen and in the path of said element with means associated with said member whereby said element engages therewith to simultaneously open said clamp and arrest rotative movement of said platen at a determinate point only when said platen is rotated in one direction.

2. A rotary duplicator of the character described having a rotatable printing platen with means for securing a master copy sheet thereto and means for rotating said platen in opposite directions, an element pivotally secured within said platen and rotatable therewith, a member secured to said element, a second member fixedly disposed within said platen and in the path of said first member with means associated with said second member whereby said first member engages therewith to arrest rotative movement of said platen at a determinate point only when said platen is rotated in one direction.

3. A rotary duplicator of the character described having in combination a rotatable printing platen with means for rotating said platen in opposite directions, a recess in the peripheral face of said platen and extending longitudinally thereof, a clamp for securing a master copy sheet to said platen, said clamp including a clamp bar disposed in said recess and substantially flush with the peripheral face of said platen, a rotatable element disposed within said platen and associated with said clamp bar to control the positioning thereof, a stationary element within said platen and which is adapted to coact with said rotatable element to open said clamp and simultaneously arrest rotative movement of said platen in one direction, said element being ineffective when the said platen is rotated in its opposite direction.

4. A rotary duplicator of the character described having a rotatable printing platen and means for rotating said platen in opposite directions, a yielding clamp member for securing a master copy sheet to said platen, an extension associated with said clamp and engaging within said platen, a member pivotally secured to and disposed within said platen, said member being adapted to be operatively engaged with said clamp extension, said pivoted member including an extending portion, a fixed member disposed within said platen and in the path of said extending portion, an aperture in said fixed member, said aperture being adapted to operatively engage with said extending portion only when said platen is rotated in one direction and whereby further rotative movement of the platen in that direction is arrested and said clamp is simultaneously opened.

5. A rotary duplicator of the character described having a rotatable printing platen and means for rotating said platen in opposite directions, a yielding clamp member for securing a master copy sheet to said platen, a member pivotally secured to and disposed within said platen, said pivoted member including an extending portion, a fixed member disposed within said platen and in the engaging path of said pivoted member portion, an aperture in said fixed member, said aperture being adapted to operatively engage with said extending portion only when said platen is rotated in one direction and whereby further rotative movement of said platen in that direction is arrested.

FREDERICK W. STORCK.