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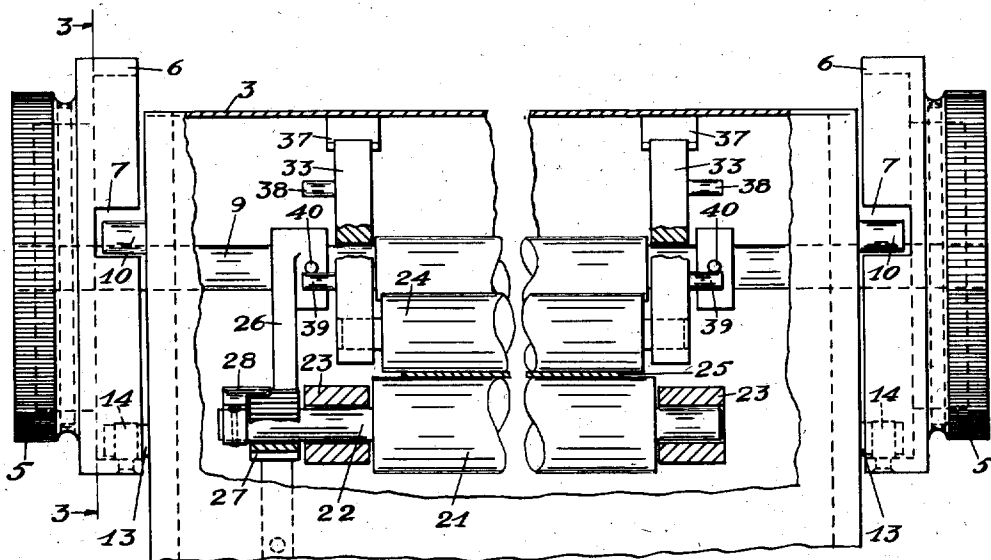
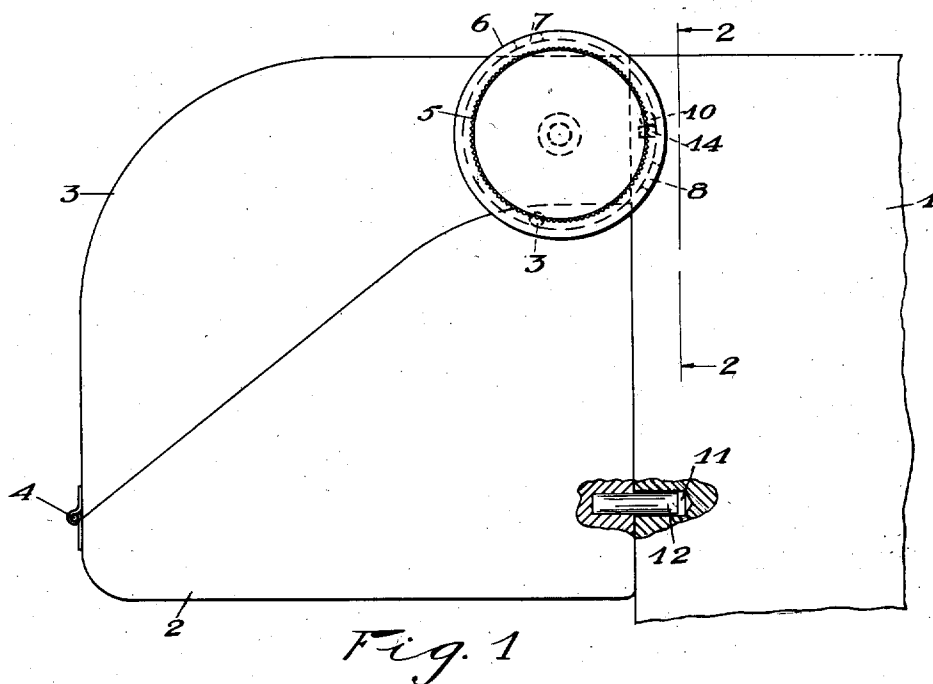
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2,019,788

PHOTOCOPY MACHINE

Filed April 3, 1935

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

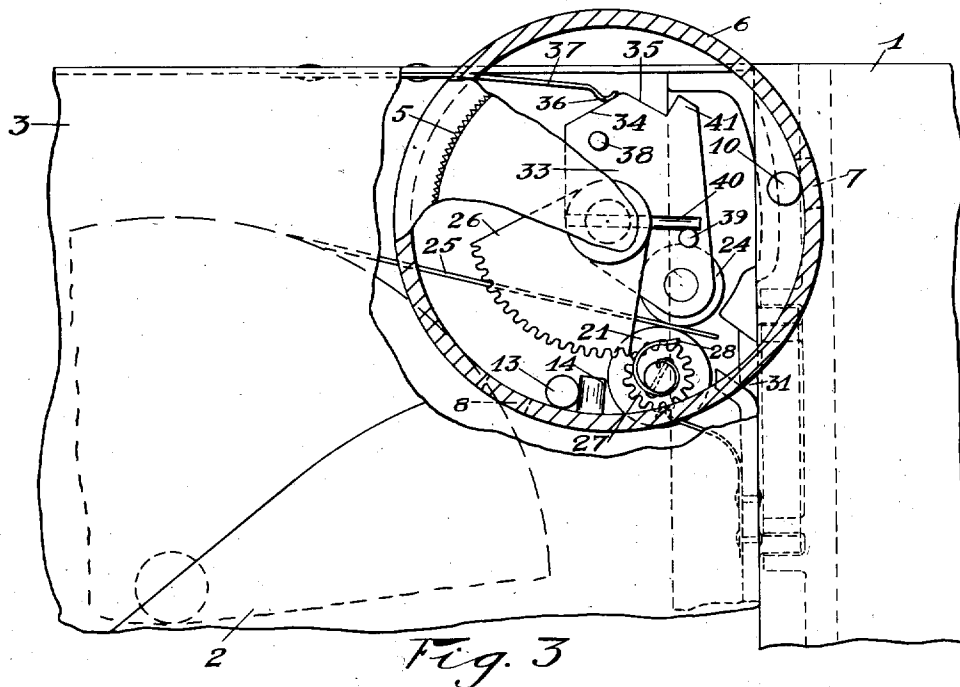


Fig. 3

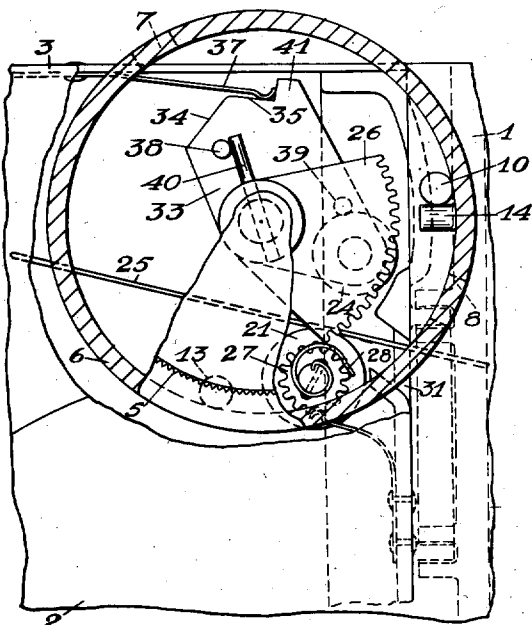


Fig. 4

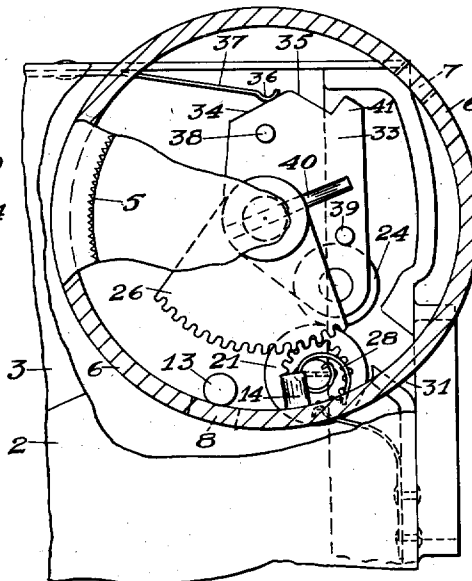


Fig. 5

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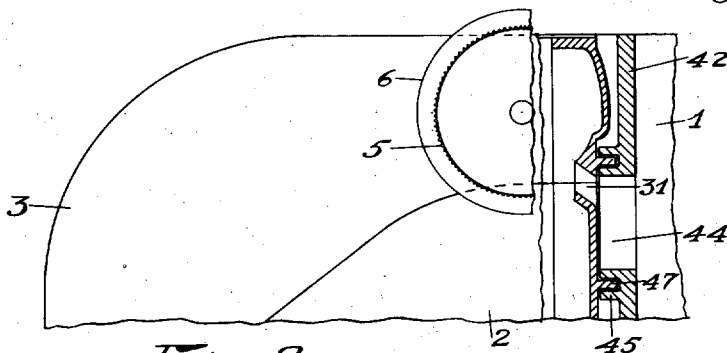
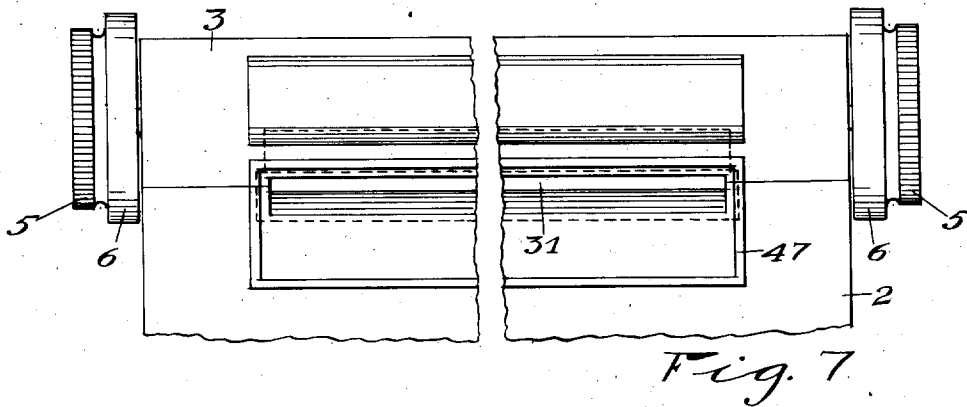
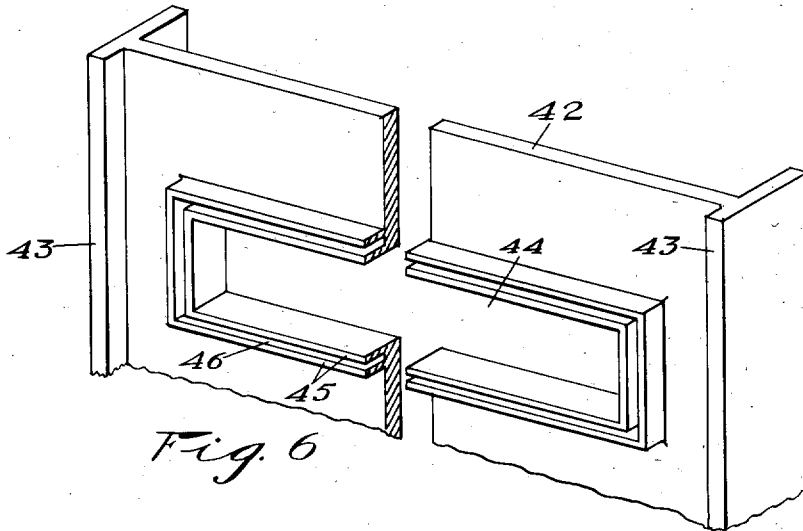
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3 Sheets-Sheet 3



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2,019,788

PHOTOCOPY MACHINE

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Application April 3, 1935, Serial No. 14,514

17 Claims. (Cl. 95—34)

This invention relates to a photo-copy machine, and has more particular reference to a removable roll box and mechanism for detachably locking the roll box in operative relation to the body of the machine.

One object of the invention is to afford a simple and practical mechanism that serves to hold a removable roll box in operative relation to the body of a photo-copy machine, and at the same time to retain the cover of the roll box engaged with the main portion thereof.

A further purpose of the invention is to afford mechanism for threading the photo-copy paper from the roll box into the body of the machine, and accomplishing this automatically by a paper feed mechanism that is actuated by the locking mechanism so that the paper is fed as the roll box is locked to the body of the machine.

Still a further object of the invention is to provide a pressure roll which functions also as a light guard cooperating with the slot through which paper is fed from the roll box, and to control the pressure roll from the locking mechanism in such a way that the pressure roll is engaged with a feed roll and covers the light opening when the roll box is released, and is automatically moved away from the feed roll after the paper is threaded into the body of the machine during the operation of locking the roll box in position.

To these and other ends, the invention consists in the arrangement and construction of parts that will appear clearly from the following description when read in conjunction with the accompanying drawings, the novel features being pointed out in the claims following the specification.

In the drawings:

Fig. 1 is a side elevation, partially in section, showing a portion of the body of a photo-copy machine with the roll box locked thereon;

Fig. 2 is a vertical sectional view on line 2—2 of Fig. 1, with the wall of the body of the machine broken away to show the interior mechanism of the roll box, the mechanism being broken away at the center and portions appearing in section;

Fig. 3 is a transverse vertical sectional view on line 3—3 of Fig. 2, with the end wall of the roll box broken away, showing the interior mechanism in end elevation in the position assumed when the roll box is to be removed from the body of the machine or when initially positioned thereon, and before locking it in operative relation;

Fig. 4 is a similar view showing the position of the parts after the roll box is locked in operative relation on the body of the machine;

Fig. 5 is a similar view of the roll box removed

from the body of the machine, showing the position of the locking mechanism to permit opening the roll box;

Fig. 6 is a partial perspective view of the body of the machine;

Fig. 7 is a view in partial front elevation of the roll box, and

Fig. 8 is a vertical transverse sectional view, partially in elevation, of the roll box in position on the body of the machine.

The invention set forth herein is in the nature of an improvement on the structure disclosed in Patent No. 1,998,324, issued April 16, 1935, to Whitten P. Lloyd, and referring more particularly to the drawings in which like reference characters refer to the same parts throughout the several views, 1 designates the body portion of the photo-copy machine to which is removably attached the roll box comprising a body and cover, or two relatively separable portions 2 and 3 which are hinged together at 4 to permit opening the roll box when it is removed from the body of the machine for inserting a fresh roll of photo-copy paper therein.

The invention contemplates locking means for holding the portions 2 and 3 of the roll box together, and also holding the roll box in operative relation to the body of the machine, and to this end, the locking means includes a rotary wheel including a hand engaging or operating portion 5 and a peripheral locking portion or flange 6, said peripheral locking portion being provided with slots or openings 7 and 8 for a purpose that will appear presently.

There are preferably two such rotary wheels, one at each end of the roll box, and fixedly mounted on a spindle 9 that is suitably journaled in the end walls of the portion 3, or cover of the roll box, while 10 designate pins or projections extending laterally from the end walls of the body of the machine and fixed thereon. Thus the roll box is brought into operative position with reference to the body of the machine when the locking wheels are in the position shown in Fig. 2 by positioning the roll box thereagainst with the slots or openings 7 registering with and passing over the projections 10 until the latter are inside the peripheral locking portions or flanges 6 of the locking wheels, as shown in Fig. 3. Then by turning the locking wheels in an anti-clockwise direction to the position shown in Fig. 4, the inner surfaces of the peripheral locking portions 6 engage the projections 10 and hold the roll box fixedly in operative relation. To assist in centering the roll box on the body

of the machine, the latter may have one or more pockets or recesses 11 engaged by a pin 12 carried by the roll box, as shown in Fig. 1.

The locking wheels previously described also act to hold the cover 3, which carries the spindle 9 and locking wheels, engaged with the body 2 of the roll box, and to this end the inner surfaces of the peripheral locking portions 6 of the said wheels engage pins or projections 13 projecting laterally from the end walls of the body 2 of the roll box, as shown in Figs. 1 and 2, and the roll box can be opened, when removed from the body of the machine, by turning the locking wheels to the position shown in Fig. 5 in which the projections 13 are aligned with the slots or openings 8 in the locking wheels, and the cover 3 of the roll box can then be swung upwardly away from the body 2.

14 designates stops projecting inwardly from the peripheral locking portions 6 and acting to limit the movements of the locking wheels from one extreme position in engagement with pins 13, as shown in Fig. 3, to the other extreme position in engagement with pins 10, as shown in Fig. 4, the Fig. 3 position permitting removing or assembling the roll box with relation to the body of the machine, and the Fig. 4 position constituting the final position when the roll box is located in operative relation.

In the present construction, the operation of the locking means already described is utilized to effect threading of the paper from the roll box into the body of the machine as the roll box is locked thereon, so as to avoid unnecessary waste of paper and obviate the necessity of doing this by hand. To accomplish this, there is provided a paper feed mechanism comprising a feed roll 21 mounted on a spindle 22 which is suitably journaled in bearings 23, while 24 is a pressure roll that is automatically moved into and out of operative engagement with the feed roll in a manner that will presently be described, thus feeding or threading the sheet of photo-copy paper 25 which is supported in the roll box in any suitable fashion, as for instance, in the manner illustrated in said patent previously referred to.

The feed roll 21 is actuated by the locking mechanism when the locking wheels are moved to lock the roll box in operative relation on the body of the machine, and to accomplish this the spindle 9 is provided with a gear element preferably consisting of a toothed segment 26 that is fixed on spindle 9 and arranged to engage a pinion 27, the latter being loosely mounted on spindle 22 and operatively connected therewith by a coil spring 28, one end of which is fixedly attached to the spindle 22 while the other end of said spring is engageable with the teeth of said pinion 27. By this arrangement, when the gear segment 26 is moved in an anti-clockwise direction with reference to Fig. 3, a tooth of the pinion 27 engages the free end of spring 28 and carries the same with it, thus turning the spindle 22 and feed roll 21, causing the paper strip 25 to be fed through the slot 31 of the roll box into the body of the machine. This operation takes place as the locking wheels are moved from the position shown in Fig. 3 into the locking position shown in Fig. 4, and when the locking wheels are moved in the reverse direction to permit removal of the roll box from the body of the machine, the pinion 27 turns freely on spindle 22, its teeth riding under the free end of the spring 28 and without effecting any reverse movement of the

paper feed roll so that no movement of the paper takes place during the reverse travel of the locking mechanism, and with this arrangement, paper can be withdrawn manually from the roll box, if desired, without movement of the pinion 27, when the roll box is removed from the body of the machine.

The pressure roll 24, when in the position shown in Fig. 3, acts as a light guard when the roll box is removed from the body of the machine, to prevent light entering through slot 31 from reaching the interior of the roll box and affecting the paper, and it is essential that the pressure roll 24 be removed from engagement with feed roll 21 after the paper is threaded into the body of the machine and the roll box is locked thereon, and this is preferably accomplished automatically by the locking mechanism.

For this purpose, the pressure roll 24 is journaled in a pair of brackets 33 which are loosely journaled on spindle 9, and are provided at their upper ends with angular faces 34 and 35 engageable alternately by the curved ends 36 of leaf springs 37 which are fixedly secured to the top wall of the roll box. The springs 37 by engagement with the surfaces 34 hold the pressure roll in the operative position shown in Fig. 3, and in order to move the pressure roll out of such position after the paper is threaded, the said brackets are provided with laterally projecting pins 38 and 39 while 40 designate arms or rods fixedly connected to spindle 9 and extending laterally therefrom for engagement alternately with the pins 38 and 39.

With the parts in the position shown in Fig. 3, the locking wheels are turned anti-clockwise to lock the roll box on the body of the machine, during which movement the paper is threaded into the body of the machine as already described, and at the limit of such locking movement, the rods 40 engage the pins 38 on brackets 33, and swing said brackets from the position shown in Fig. 3 to that shown in Fig. 4, thus elevating the pressure roll out of contact with the paper and the feed roll. The springs 37 then engage the surfaces 35 and abutments 41 and act to retain the brackets in such position with the pressure roll elevated as long as the roll box is locked on the body of the machine, abutments 41 limiting the upward movement of the pressure roll.

When it is desired to remove the roll box, the locking wheels are turned in a clockwise direction, at the limit of which movement the rods or arms 40 engage the pins 39, swinging the brackets 33 back to the position shown in Fig. 3 with the pressure roll again engaged with the paper sheet and in position to obstruct light opening 31. The parts are then in position to permit removal of the roll box from the body of the machine, after which, in case it is desired to open the roll box, for replenishing the supply of paper or for any other purpose, the locking wheels can be turned in an anti-clockwise direction until openings 8 are aligned with the pins or projections 13, as shown in Fig. 5, and the portions of the roll box separated.

The body portion of the machine includes a main wall 42 having vertical end flanges 43, against which the roll box abuts, and 44 is the paper receiving opening through which paper is fed from the opening 31 in the roll box.

The body portion carries flanges 45 of rectangular formation around opening 44, and affording a recess or slot 46, that receives a corre-

sponding flange 47 on the roll box, and thus effecting a light tight joint between the body of the machine and the roll box.

While the invention has been described with reference to certain mechanical details, it is not confined to the particular form or arrangement of parts herein disclosed, and this application is intended to cover any departures or modified arrangements coming within the purposes of the invention or the scope of the following claims.

We claim:

1. In a removable roll box for a photo-copy machine, the combination with movable locking means for holding the roll box in operative relation to the body of the machine, of paper feeding mechanism for threading paper from the roll box into the body of the machine, and devices actuated automatically by the locking means to operate the paper feeding means when the locking means is moved to locking position to thread the paper from the roll box into the body of the machine.

2. In a removable roll box for a photo-copy machine, the combination with movable locking means for holding the roll box in operative relation to the body of the machine, of paper feeding means for threading paper from the roll box into the body of the machine, said paper feeding means including a driven element and a driving element operatively associated therewith and connected for movement with the locking means to actuate the paper feeding means when the locking means is moved to locking position.

3. In a removable roll box for a photo-copy machine, the combination with a rotary shaft having a wheel fixed thereon, said wheel including a peripheral locking portion for holding the roll box in operative relation to the body of the machine, a gear element fixed on said shaft, paper feeding mechanism for threading paper from the roll box into the body of the machine, and a pinion connected to said paper feeding mechanism and adapted to be operated by said gear element.

4. In a removable roll box for a photo-copy machine, the combination with movable locking means for holding the roll box in operative relation to the body of the machine, of paper feeding mechanism for threading paper from the roll box into the body of the machine, devices actuated automatically by the locking means to operate the paper feeding means when the locking means is moved to locking position to thread the paper from the roll box into the body of the machine, said paper feeding mechanism including a feed roll and a pressure roll, and means acting automatically to move the pressure roll away from the feed roll as the locking means moves to locking position and to return the pressure roll into engagement with the feed roll as the locking means moves to releasing position.

5. In a removable roll box for a photo-copy machine, the combination with movable locking means for holding the roll box in operative relation to the body of the machine, of paper feeding means for threading paper from the roll box into the body of the machine, said paper feeding means including a driven element and a driving element operatively associated therewith and connected for movement with the locking means to actuate the paper feeding means when the locking means is moved to locking position, a feed roll and a pressure roll, and means acting automatically to move the pressure roll away from the feed roll as the locking means moves to lock-

ing position and to return the pressure roll into engagement with the feed roll as the locking means moves to releasing position.

6. In a removable roll box for a photo-copy machine, the combination with a rotary shaft having a wheel fixed thereon, said wheel including a peripheral locking portion for retaining the roll box in operative relation to the body of the machine, a gear element fixed on said shaft, paper feeding mechanism for threading paper from the roll box into the body of the machine, a pinion connected to said paper feeding mechanism and adapted to be operated by said gear element, said paper feeding mechanism including a feed roll and a pressure roll, and means acting automatically to move the pressure roll away from the feed roll as the locking means moves to locking position and to return the pressure roll into engagement with the feed roll as the locking means moves to releasing position.

7. In a removable roll box for a photo-copy machine, said roll box having a slot through which paper passes therefrom to the body of the machine, locking means operable to hold the roll box in operative position to the body of the machine, a movable light guard cooperating with said slot through which the paper passes from the roll box, spring means cooperating with the light guard to hold it in either of its extreme positions, and devices controlled automatically by movement of said locking means and acting to operate the light guard in one direction or the other when the locking means is moved.

8. In a removable roll box for a photo-copy machine, said roll box having a slot through which paper passes therefrom to the body of the machine, a shaft journaled in the roll box, a wheel fixed on said shaft, said wheel having a peripheral locking portion, a light guard, a support for said light guard journaled in the roll box and rotatable about said shaft, stops on said support, and means carried by said shaft and movable to engage one or the other of said stops to actuate the light guard into its operative or inoperative positions upon movement of the locking means.

9. In a removable roll box for a photo-copy machine, said roll box having a slot through which paper passes therefrom to the body of the machine, a shaft journaled in the roll box, a wheel fixed on said shaft, said wheel having a peripheral locking portion, a light guard, a support for said light guard journaled in the roll box and rotatable about said shaft, stops on said support, means carried by said shaft and movable to engage one or the other of said stops to actuate the light guard into operative or inoperative positions upon movement of the locking means, and a spring engageable with said support and acting to hold the latter in either of its extreme positions.

10. In a removable roll box for a photo-copy machine, said roll box including relatively separable portions, of a locking stop on one of said portions and locking means on the other of said portions including a rotary wheel having a peripheral locking portion for locking engagement with said stop, said locking portion being also adapted for locking engagement also with the body portion of the machine.

11. In a removable roll box for a photo-copy machine, said roll box including relatively separable portions, of a locking stop on one of said portions and locking means on the other of said portions including a rotary wheel having a pe-

ripheral locking portion, said locking portion being adapted for locking engagement with said stop and with the body portion of the machine and having a plurality of slots, one to receive said stop and the other to receive a stop on the body portion.

12. In a photo-copy machine, the combination with a body portion having a locking stop thereon, of a roll box removable from the body portion, a locking means comprising a rotary wheel carried by the roll box and having a peripheral locking portion which is slotted to permit the roll box to be brought into operative relation with or removed from the body of the machine.

13. In a removable roll box for a photo-copy machine, a locking means comprising a rotary wheel having a peripheral locking portion which is slotted to receive a locking stop, paper feeding mechanism, and devices for operating the paper feeding mechanism when said wheel is turned in one direction.

14. In a removable roll box for a photo-copy machine, said roll box including relatively separable portions, locking means carried by the roll box and adapted to cooperate with locking stops on one of said separable portions and on the body of the machine that is operable to hold said separable portions together and also to hold the roll box in operative relation to the body of the machine.

15. In a removable roll box for a photo-copy machine, said roll box including relatively separable portions, locking means comprising a rotary wheel having a peripheral locking portion adapted to cooperate with locking stops on one of said separable portions and on the body of the machine to hold the box closed and to hold the box in operative relation to the body of the machine.

16. In a removable roll box for a photo-copy machine, the combination with movable locking means for holding the roll box in operative relation to the body of the machine, and devices controlled by said locking means for threading paper from the roll box into the body of the machine.

17. In a removable roll box for a photo-copy machine, the combination with movable locking means for holding the roll box in operative relation to the body of the machine, of paper feeding mechanism for threading paper from the roll box into the body of the machine, said paper feeding mechanism including a feed roll and a pressure roll, and operative connections between the locking means and paper feeding mechanism for operating the feed roll and controlling the position of the pressure roll.

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