United States Patent

Komori et al.

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[45] **Dec. 5, 1972**

[54] **COPYING DEVICE HAVING A SLIT-EXPOSURE SYSTEM**

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[73] Assignee: **Canon Kabushiki Kaisha Co. Ltd.**

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[21] Appl. No.: **22,115**

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[63] Continuation of Ser. No. 688,213, Dec. 5, 1967, abandoned.

[30] **Foreign Application Priority Data**

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Aug. 10, 1967 Japan 42/51514

[52] **U.S. Cl.** **355/8,** 355/10, 355/27, 355/51, 355/66

[51] **Int. Cl.** **G03g 15/00**

[58] **Field of Search** 355/8, 10, 27, 51, 65, 66

[56] **References Cited**

UNITED STATES PATENTS

3,421,816 1/1969 Robertson et al. 355/8

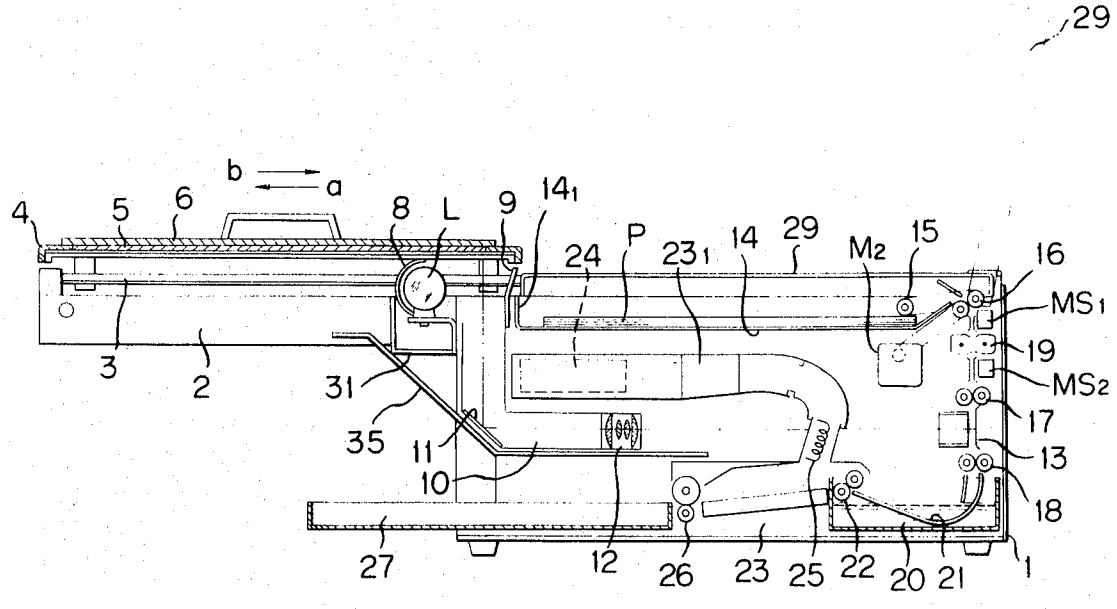
3,424,526 1/1969 Sacre 355/10

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[57] **ABSTRACT**

A compact, electrophotographic copying device in which the copy stand is horizontally moveable over the top of the copier housing. Copy on the copy stand is illuminated through a slit exposure system at one end of the housing, and the reflected image passes through an L-shaped optical system to the exposure portion at the other end of the housing. Photosensitive copy paper moves downwardly across this portion synchronously with movement of the copy stand. The copy paper is fed from a feed position between the copy stand and the optical system.

10 Claims, 10 Drawing Figures



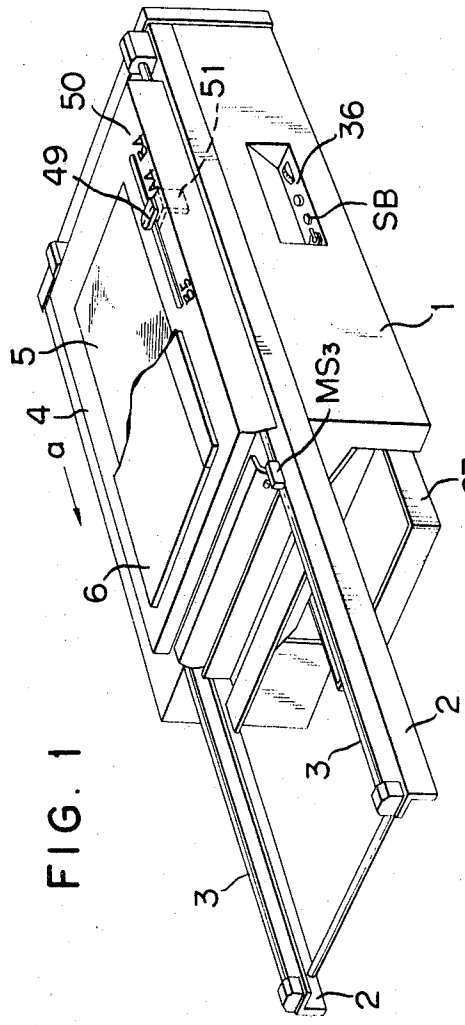

50
51
49
36
SB
5
4
a
MS3
1
27
6
2
3
3
2

FIG. 1

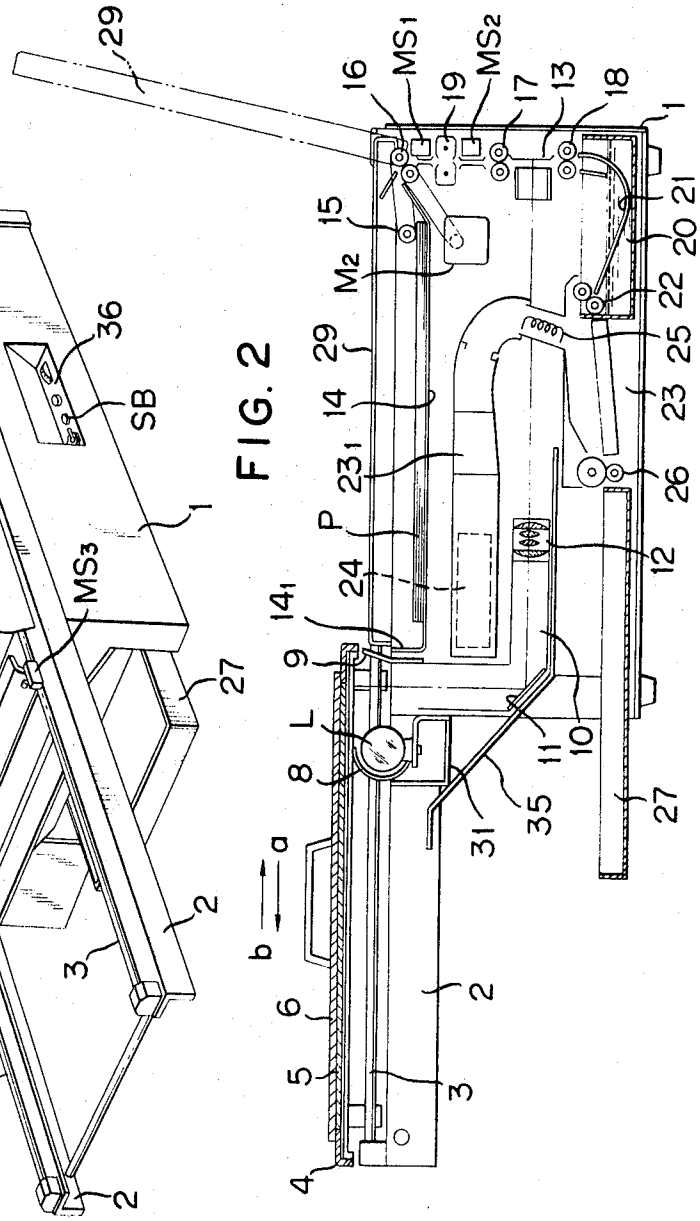

29
16
MS1
19
MS2
17
13
18
1
21
20
15
M2
22
29
25
14
23
23
1
26
P
12
24
14
1
9
L
8
11
10
35
31
27
b
a
6
5
4
2
3

FIG. 2

FIG. 3

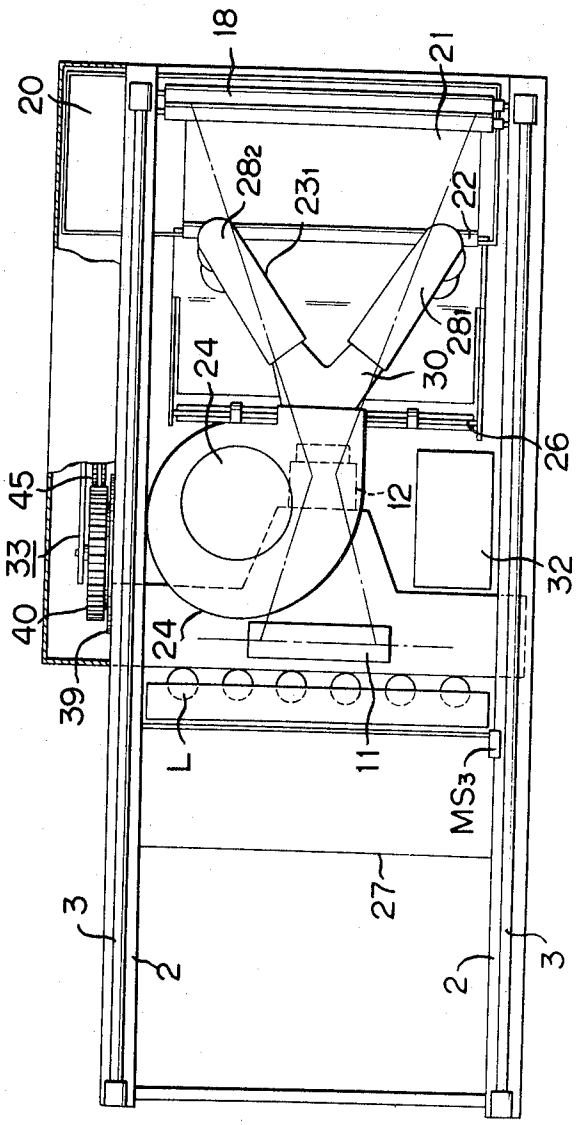


FIG. 4

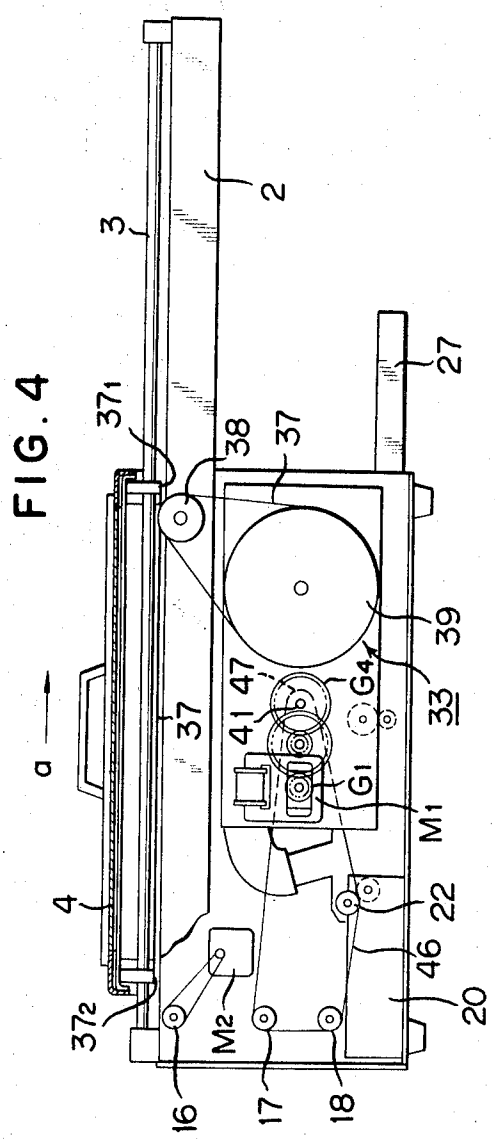

a
2
3
37_1
38
37
27
39
33
47
41
G_4
G_1
M_1
37
4
22
46
20
37_2
M_2
16
17
18

FIG. 6

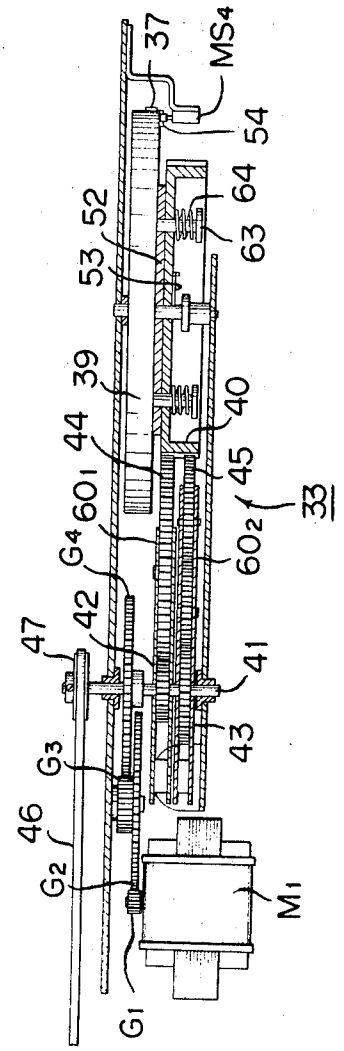

37
MS_4
54
64
52
63
53
39
40
44
45
60_1
33
G_4
60_2
42
47
41
43
G_3
46
G_2
M_1
G_1

FIG. 5

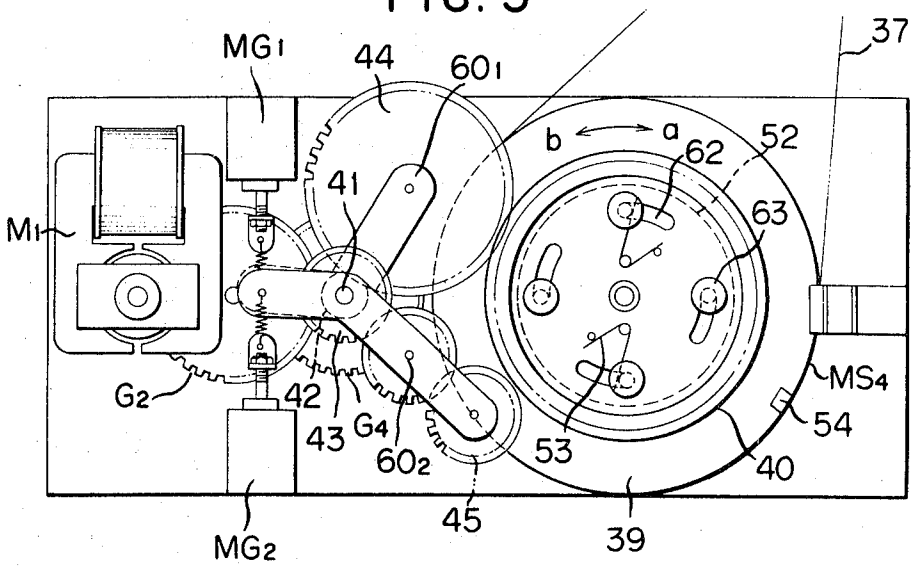


FIG. 7

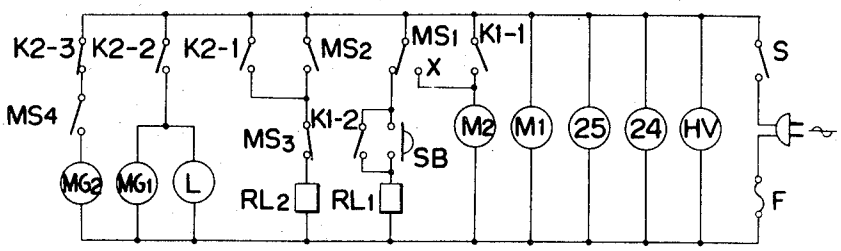
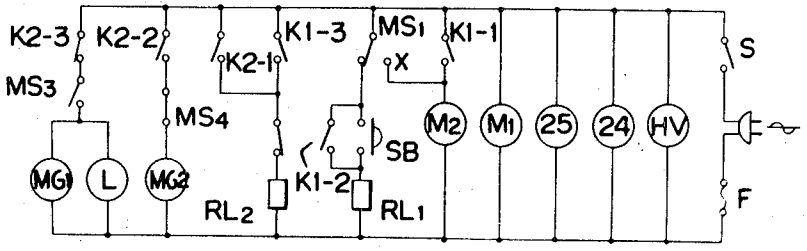


FIG. 8



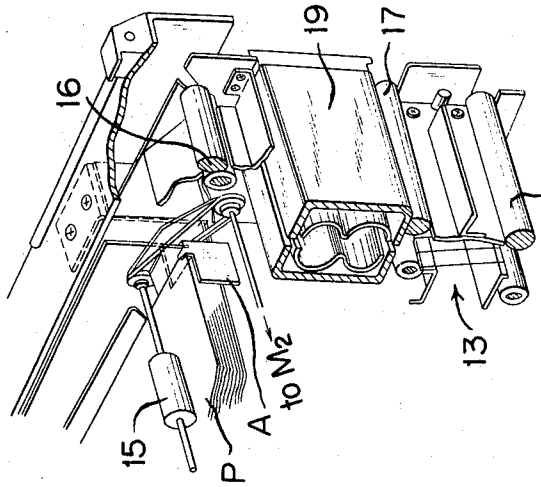


FIG. 9

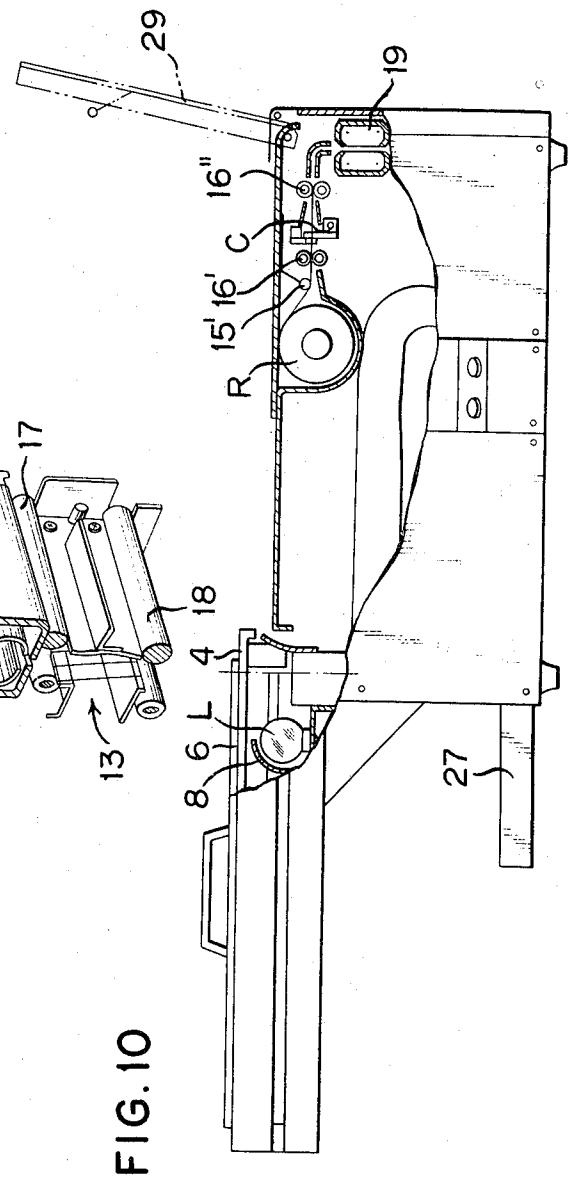


FIG. 10

COPYING DEVICE HAVING A SLIT-EXPOSURE SYSTEM

This application is a continuation of application Ser. No. 688,213, filed Dec. 5, 1967 and now abandoned.

This invention relates to a copying device and more in particular relates to a copying device of slit exposure system in which the copy stand moves, and relates to an electrophotographic copier of the same system.

Generally speaking, the capacity of the light source of a copier of slit-exposure system is smaller than that of the copying devices of such a system according to which the whole surface of the copy is simultaneously exposed, and it is well known to those skilled in the art that slit-exposure system is more advantageous in that the device of slit-exposure system can be minimized when compared with the all out exposure system.

As the conventional copiers of such a system as above, the copiers of a system in which a copy is fixed, and the light source and the photosensitive plate are moved at the equal speed, and the lens on the light axis is moved at one half of the speed of the motion of the photosensitive plate (in case of equimagnification copying), and the equimagnification image is obtained on the photosensitive plate through the fixed slit, are known, but in such a system as this, the distance between the fixed copy and the photosensitive plate becomes great, and the device becomes larger, which is accounted to be the drawback of the conventional system.

There is another prior system proposed as the counter measures for removing said drawback, according to which two fixed mirrors are provided on the light path of the optical system, and the light rays coming from the copy generated by the moving light source, are reflected sidewise by the first fixed mirror to lead the reflected light rays into the moving lens, and the penetrating light rays are reflected by the second fixed mirror parallely provided with first fixed mirror, and are led into the fixed slit, but in accordance with this system, the drawback of the preceding conventional system can be removed by bending the light path by the two fixed mirrors, and it is possible to minimize the device to some extent, but the position of the light axis of the light rays coming into the first fixed mirror and the second fixed mirror, is gradually moved on the mirrors along with the movement of the light source and the lens, and therefore, the width of the first and second mirrors is required to correspond to the moving distance of the light source, i.e., correspond at least to the width of the copy image in the scanning direction.

To use such large fixed mirrors brings about such disadvantages as the complicatedness of the mechanism for retaining the precision of angle, and the plane surface, and the processing of the mechanism or the like, and as a result the apparatus becomes more expensive.

This invention relates to copying device which has different system from those copying devices of the conventional system, and this invention which removes all the drawbacks of the conventional devices has such advantages that the device is small and light, and the operationability is excellent.

In other words, this invention is characterized in that a copy stand which moves horizontally above the casing of the copier, is provided, and the moving copy is illuminated in the form of slit at one end of the casing, and the image of the reflected light is introduced to the exposing portion at the other end of the casing, and the photosensitive paper moving in synchronous movement along with the copy, is exposed, and the photosensitive paper feeding base is provided in the space at the upper portion of the casing between the moving copy stand and L letter form optical system.

An object of this invention is to provide the copying device of slit-exposure system of high utility which is small and light and is very convenient to operate, and has removed all the drawbacks of the conventional devices.

Another object of this invention, is to provide a compact copier of slit-exposure system in which a reciprocating copy stand and L letter form optical system are adopted, and the copy is slit-exposed, and at the same time a photosensitive material feeding portion is provided within the chamber between the stand and the optical system so that the space of the device, can be fully utilized.

Another object of this invention is to provide the copying device of slit-exposure system in which the illuminating device and the exposing portion are provided at the respective end portions of the casing, and the increase of the temperature of the photosensitive plate and the casing is lowered as much as possible.

Another object of this invention is to provide the copying device of slit-exposure system in which a blower-duct is provided at an appropriate position inside the casing, and thereby the cooling of the illuminating means is carried out and at the same time it takes part in the drying of the photosensitive paper.

Another object of this invention is to provide the copying device of slit exposure system in which the jetting opening of the blower-duct is forked, and by facing the forked ducts against both end portions of the photosensitive paper without interfering the light path of the optical system to increase the drying effect of the photosensitive paper.

Another object of this invention is to provide the copying device of slit-exposure system in which a member for preventing the natural exposure of the photosensitive paper is provided, and even if the device is erroneously operated when the member is placed at its not-operation position, the machine is prevented from damaged.

Another object of this invention is to provide the copying device of slit-exposure system in which the driving means for synchronously carrying out the movement of the copy stand and the photosensitive material is provided in combination of a simple normal-reversal rotation mechanism with the drive shaft which is rotated in a definite direction.

Another object of this invention is to provide the copying device of slit-exposure system in which the moving copy stand can satisfactorily move over the exposure process in accordance with the size of the copy.

Further object of the invention is to provide the copying device of slit-exposure system in which during one directional movement of the stand, the photosensitive material is fed to a predetermined position and charged, while during another directional movement of the stand, the photosensitive material is exposed.

Other objects and the characteristics of this invention will be clarified from the detailed explanations of illustrative embodiments of this invention in accordance with the attached drawing in which:

FIG. 1 shows an appearance of an electrophotographic copying device according to this invention;

FIG. 2 is a vertical cross section of FIG. 1;

FIG. 3 is a horizontal cross section of FIG. 1;

FIG. 4 shows its driving mechanism;

FIG. 5 shows a reciprocating mechanism for moving the copy stand;

FIG. 6 shows an elevation of FIG. 5;

FIGS. 7 and 8 show circuits used for the inventive device;

FIG. 9 shows a portion of sending mechanism of the photosensitive sheet paper; and

FIG. 10 shows a portion of sending mechanism of the photosensitive paper wound around the roller.

Concrete explanations are given about the embodiments shown in the attached drawings, in which **1** is a casing, **2** is an arm extending on one side of the casing from the upper portion thereof (on the left side in FIG. 2), and the guide rail **3** of the copy stand **4** is provided on the arm **2** and the casing **1**, **5** is a glass plate on the copy stand, **6** is a rubber plate for controlling the copy on the glass plate, L is a lamp for illuminating the moving copy, and **8** and **9** are the reflecting covers for concentrating the light rays in the form of slit.

The optical system **10** is an L form cylinder containing a mirror **11** and a lens **12** for leading the image of the copy into the exposing portion **13**, **14** is a paper feeding base provided in] shaped space formed by the rail **3** and the L letter form optical system **10**; **15** is a feed roller for feeding photosensitive papers p laid on the base **14** one by one, and leads the photosensitive papers almost perpendicularly down to the charging portion **19** and the exposing portion **13** through three pairs of rollers **16** through **18**. The photosensitive papers abut to the projected plate A by the rotation of the roller **15**, and as the roller **15** further rotates the top paper alone climbs up the plate A by the frictional force so as to be fed between the pair of rollers **16**. The member **20** is a liquid developer provided at the lower portion of the optical system **10**, i.e., on the bottom portion of the casing, and develops the photosensitive papers sent from the roller **18** along the guide plate **21**, and after having squeezed the liquid with the squeeze-rollers **22**, the developed paper is led to the drier **23**. Within the drier **23**, the air in the neighborhood of the illuminating portions **7** to **9** suctioned by a blower **24** and sent through a duct 23_1 into a heater **25** is heated therein and blown to the photosensitive paper sent from the developer **20**, and the drying and the fixing of the image is carried out, and then the photosensitive paper is sent into the copy-tray **27** by the send-rollers **26**.

The heater **25** is provided inside the duct, but it can be sometimes provided outside the duct, or the drying-fixation of the image can be done directly by the heater, and air is appropriately sent towards the heater from the duct to prevent the over-heating. The driving mechanism generally designated by **33** of the copy stand (FIG. 3) and the driving mechanism of the send-rollers **17** and **18** are interlocked so that the transmission-speed of the photosensitive papers P passing through the exposure portion **13** and the advancing speed of the copy stand **4** in the direction shown by an arrow *a* can be made equal. Throughout the specification, the advancing movement is in the direction of the arrow *a* and the reversing movement is in the direction of an arrow *b*.

The copy stand reciprocating mechanism **33** has such a structure as is shown in FIG. 4, that the belt **37** connected to both ends 37_1 and 37_2 of the copy stand **4** is wound around the reciprocating drum **39** through the guide roller **38** to reversibly rotate the reciprocating drum **39**, and FIG. 5 shows its details.

The feed-roller **15** and the send-rollers **16** are interlocked to the rotating portion of the independent motor or rubber rollers **17**, **18** through a clutch, and when the photosensitive paper passes through the feed-roller **15**, the following photosensitive paper is continuously sent out, and the photosensitive paper operates a microswitch MS_1 to stop the operation of the reciprocating mechanism **33** (FIG. 2). The rubber rollers **17**, **18**, the developer **20**, and the drier **23** are driven by the main motor M_1 through the chain **46** (FIG. 4).

The copy stand reciprocating mechanism is interlocked so that when the copy stand **4** is stopped on the right side as is shown in FIG. 1, and a copy is placed, and when the start-button SB provided on the operation board **36** (FIG. 1) is pushed, the photosensitive paper P can be started, and the advancing movement in the direction of the arrow *a* of the copy stand for exposing can be started right before the end of the photosensitive paper P begins to enter the exposure portion. The image of the copy is led to the exposing portion **13** when the copy stand **4** is advanced, and the photosensitive paper is slit-exposed.

The duct 23_1 of the drier **23** is provided in the space between the lower portion of the paper feeding base **14** and the L letter form optical system, and the end portion thereof is shaped into forked ducts 28_1 and 28_2, and these forked ducts are passed outside of the both end surfaces of the optical system, respectively, and hot air is sent to the position close to both end portions of the drier. The blower **24** sucks the air in the interval between the aslant partition cover **35** of the copy tray **27** at the lower portion of the lamp L and in the neighborhood of the rear wall surface 14_1 of the paper feeding base **14**. Namely, the blower **24** sucks the hot air above the optical system and around the lamps L, and prevents the deterioration of the photosensitive paper, which is caused since the left end portion of the paper feeding base is heated by the radiant heat carrying convertion reflected by the reflecting board **9**, and as a result, the photosensitive paper is heated thereby, and at the same time the blower **24** saves the wattage of the heater by making use of the calorie in the drying operation, and it also accelerates the uniform drying all over the photosensitive paper by the forked ducts 28_1 and 28_2 since both ends of the photosensitive paper cannot be easily dried while the central portion of the photosensitive paper can be easily dried. The lamps L are provided on the left end portion of the casing **1**, and is covered with a member of excellent ventilation such as a punching metal. This is for transmitting the heat of the lamp only by little into the casing as well as the inside thereof, and at the same time this enables the sufficient cooling by the outer air.

The lid **29** is provided on the paper feeding base **14** for preventing the deterioration of the photosensitive paper caused by the pre-exposure, and the placing of photosensitive papers on the base **14** can be done by opening the lid **29**, and by manually holding up the feed-roller **15**. It is so planned in size that when the

machine is operated with the lid open or with the feed roller held up by mistake, the copy stand will not hit the lid or the feed-roller. When the lid is closed, the feed-roller is pushed by the closing operation to turn back to the position of operation.

The cover plate **35** prevents hot air exhausted from the outlet opening of the drier to be retained within the machine and at the same time, prevents the hot air from gradually increasing the temperature inside the machine as it turns back directly to the lamps, and circulates between the lamps and the drier to lose the cooling effects after all. Therefore, the air sucked by the blower **24** is the outer air not covered by the front cover **35**, and therefore the cooling effect working on the lamps is made excellent.

The copy stand can be designed so that it can be moved either from advancing (in the direction *a*) to reversing direction (the copy stand stops above the casing as in FIG. **1**), or from reversing direction *b* (the copy stand stops on the left portion of the arm as in FIG. **2**) to the advancing direction *a* depending on the position where it stops. The present embodiment is an example of the movement from advancing *a* to reversing *b*, however, both cases have the following features, respectively.

1. Advancing-Reversing movement:

Advancing movement shown by the arrow *a* is the exposing process, and therefore it can be turned into the reversing movement at the position where the exposure is completed, and consequently the position at which the exposure is completed differs depending on the size of the copy or the photosensitive paper. For example, when slider **49** is set in accordance with the size of a copy, the operation piece **51** which is interlocked to the slider **49** (FIG. **1**) operates the microswitch MS_3 (FIGS. **1**, **3**) by the advancing movement of the copy stand, and it is turned into the reversing movement. Therefore, when a smaller copy is applied, the copying operation is finished faster, which can be accounted to be advantage. Notations of B_5, A_4 and B_4 generally designated by **50** are indicators for showing the size of the copy.

2. Reversing-Advancing movements:

In this case, the fore end of the photosensitive paper passes through the paper feeding and charging processes in the reversing movement (the direction *b*), and it stops right after the completion of the advancing movement, i.e., the completion of the exposing process, and the exchange of the copy can be made faster by the time required for the reversing movement. However, it is impossible to change the range of reciprocating movement in accordance with the size of the copy without changing the stop position for the exchange of the copy (original).

The following is an explanation about the reciprocating mechanism **33**. In the embodiment shown in the drawing, the drive-shaft **41** is rotated by the main motor M_1 through the speed-change gear trains G_1 through G_4, and the normal rotation gear **42**, reversal rotation gear **43**, and sprocket wheel **47** are simultaneously rotated, and thereby the paper feeding mechanism and reciprocating mechanism driven by the same motor while they are synchronized. The drive-shaft **41** is always rotated, and when a photosensitive paper P operates the micro-switch MS_2 (FIG. **2**) and enters the exposing process, the normal rotation magnet MG_1 is operated to rotate the arm 60_1 in the clockwise direction with the shaft **41** as the center of the rotation as is shown in FIG. **5**, and the normal rotation idler **44** and the reversibly rotating gear **40** are meshed to each other to the effect that the reversibly rotating gear **40** and the reversibly rotating drum **39** can be rotated in the normal direction so as to move the copy stand in the advancing direction shown by the arrow *a*.

When the copy stand completes the predetermined exposing process, and the operation piece **51** operates the micro-switch MS_3, the normal rotation magnet MG_1 is released to stop the advancing movement, and at the same time, the reversal rotation magnet MG_2 is operated to the result that the reversal rotation arm 60_2 can be rotated in the counterclockwise direction, and the reversal rotation idler **45** is meshed with the gear **40** to reversally rotates the drum **39** through the shock absorbing mechanism, and to move the copy stand in the reversing direction. In this state, the gear ratio of the normal rotation gear **42**, the reversal rotation gear **43**, and the gear **40**, is appropriately selected to determine the speed ratio of the advancing movement and reversing movement and generally quick return (quick reversing movement) is carried out to shorten the time necessary for one cycle. Therefore, a shock absorbing mechanism is provided for absorbing the shock caused by the switching of the meshing of the normal rotation gear and reversal rotation gear, as the rotation of the gear in the reversal rotation is great. For example, when the gear **40** is converted from the advancing rotation *a* to the reversal rotation *b*, the gear **40** alone is rotated by the allowance of the long hole **62** and during which the spring **53** absorbing energy, and then rotates the drum **39** through the friction board **52** and the pin **63**. When the gear **40** is rotated in the normal direction, the rotation is directly transmitted to the drum **39** through the gear **40**, pin **63**, the friction board **52**, and no lag in timing and synchronization is brought about when exposure is done. FIG. **7** shows an embodiment of the circuit structure. When the main switch S is turned on, the blower **24**, the heater **25**, the main motor M_1 begin to operate, and high pressure voltage source HV is operated. The photosensitive paper is sent out by the feed roller **15** during the copying operation, and the micro-switch MS_1 is operated with the fore end portion of the photosensitive paper to the result that the feed motor M_2 is stopped (see FIG. **2**) and the photosensitive paper is stopped between a pair of rollers **16**.

When start button SB is pushed, the relay RL_1 is operated to close the contacts K_{1-1}, and K_{1-2}, and the feed-motor M_2 is rotated to the result that the photosensitive paper is started and passed through the charging device and the microswitch MS_2 is operated, and the photosensitive paper is sent into the developer **20** and drier **23** through the exposing portion **13** by the send-rollers **17**, **18**.

On the other hand, the relay RL_2 is operated by the operation of MS_2, and the contacts K_{2-1} and K_{2-2} are closed and K_{2-3} is opened, the drum **39** which has been stopped in the state wherein the micro-switch MS_4 (FIG. **5**) is operated in the opened state by the operation piece **54**, is rotated in the normal direction as the normal rotation idler **44** and the gear **40** are geared in

by the operation of the normal rotation magnet MG_1, and the copy stand **14** is drawn by the steel belt **37** to be moved in the advancing direction *a*, and the exposure lamps L are turned on. It is hereby added that the operating position of the micro-switch MS_2 is adjusted so that the end of the image of the copy and the fore end of the photosensitive paper are agreed.

Next, the exposure of the copy is carried out by the advancing movement of the copy stand, and when the operation piece **51** which has been set in accordance with the size of the copy, operates the micro-switch MS_3, the relay RL_2 is released and the contacts K_{2-1}, K_{2-2} are opened, and the contact K_{2-3} is closed.

Therefore, when the normal rotation magnet MG_1 is released, the reversal rotation magnet MG_2 is operated, and the gear **40** is geared with the reversal rotation idler **45**, and the drum **39** is reversally rotated, and the copy stand is simultaneously moved in the reversing direction. The drum **39** is reversally rotated, and the operation piece **54** (FIG. **5**) operates the micro-switch MS_4 at the position where the copy stand terminates the reversing operation, and the drum and the copy stand are stopped, and the whole process is finished.

When the rear end of the photosensitive paper passes through the feed roller **15** before the whole process is finished, the next photosensitive paper is sent out, and the paper sending speed of the feed roller is sufficiently slower than that of the paper sending speed of the feed-roller **16** (which is the same as the feeding speed of the feed-rollers **17**, **18**), and therefore when the end of the next photosensitive paper is fed in the feed-roller **16**, the rear end of the preceding photosensitive paper has already passed the roller **16** and Ms_1. Therefore, the micro-switch MS_1 is already released, and the relay RL_1 is also released, but the motor M_2 keeps on rotation by the always closing contact (X) of the micro-switch MS_1, and is stopped by the operation of the micro-switch MS_1 with the fore end of the next photosensitive paper, and the preparation for the next copying operation is finished.

The circuit diagram in FIG. **7** shows the case where from advancing to reversing movement while the copy stand is stopping, as in FIG. **1**, right above the casing **1**, i.e., at the end of the reversing process *b*, and FIG. **8** shows the case where the reversing-advancing movement is carried out while the copy stand is stopping at the end of the advancing process *a*, i.e., the position of solid line in FIG. **2**. In FIG. **8**, when the reversing-advancing movement is carried out, the operation piece **51** for the micro-switch MS_3 of FIG. **1** is fixed on the maximum copy size, i.e., at the position of B_4 in the drawing, and the micro-switch MS_3 is opened by the operation piece **51** to open the magnet MG_1 for the normal rotation and the lamps L for exposure are closed. As is apparent from FIGS. **1** and **3**, the position of micro-switch MS_3 or the operation piece **51** can be varied for different stop positions of the copy stand. When the start button **5B** is pushed, the relay RL_1 is operated to close the contact $K_{1-1,2}$ and the photosensitive paper is started to move by the motor M_2. At the same time, the contact K_{1-3} is closed to operate the relay RL_2, and the reversal rotation magnet MG_2 is operated by the contact K_{2-2}, to move the copy stand **4** in the reversing direction. The operation piece **54** opens the micro-switch MS_4 on the drum **39** of the reversing movement as is shown in FIG. **5** at the position where the reversing movement is completed to release the reversal rotation magnet MG_2, and the copy stand **4** is stopped. When the copy stand **4** is stopped, the photosensitive paper opens the micro-switch MS_2 to release the relay RL_2, and therefore the contact K_{2-3} is closed, and the normal rotation magnet MG_1 and the exposure lamps L are operated, and the copy stand **4** is moved in the advancing direction. The operation piece **51** of the copy stand opens the micro-switch MS_3 to stop the copy stand on the position when the exposure is finished.

The present invention has been explained with respect to the sheet of the photosensitive papers, however, as shown in FIG. **10**, the photosensitive paper wound around the roll R may well be used in the present invention. In this case, it is necessary to provide a cutter C between, for example, two pairs of rollers **16'** and **16''** through which the paper advancing to the charging portion **19**.

This invention, in an electronic copier having a horizontally moving copy stand on the upper portion thereof to carry out slit exposure, was such a structure that the copy illuminating portion is provided in the front portion of the casing, and the image of the copy is projected on the exposing portion at the rear portion of the casing by means of a L letter from optical system, a paper feeding base is provided in the space formed between the copy stand moving surface on the upper portion thereof and the L letter form optical system, and therefore, the structure of this invention has an advantage to minimize the apparatus.

Furthermore, according to this invention, a liquid developer is provided at the lower portion of the casing following the exposing portion, and the photosensitive paper having passed the developing means is led into the front portion of the casing, and the air in the neighborhood of the illuminating portion is sucked by the blower duct provided in the space between the paper feeding base and L letter form optical system, and appropriately heated hot air is jetted to the photosensitive paper to carry out the dry-fixing operation, and therefore the process of development and dry fixation can be included within the casing compactly, and at the same time, the increase of the temperature within the casing caused by the radiant heat of the illuminating portion, can be controlled, and even if the illuminating portion and the paper feeding portion should be close, there is no fear that the resistivity of the photosensitive papers should be changed by temperature. An the hot air duct is divided into two, and hot air is jetted to the side end portions of the photosensitive paper, and does not interfere the light path of the optical system, and the hot air duct is effective for accelerating the drying of the rear end portion of the photosensitive paper where the drying of the developer liquid is slow. According to this invention, a lid is provided on the upper portion of the paper feeding base, to prevent the deterioration caused by the natural exposure of the photosensitive paper, and the position of the lid raising shaft is selected for safety's sake so that when the copy stand is moved by mistake while keeping the lid open for filling photosensitive papers, there is not fear that the copy stand hits the lid to cause troubles.

We claim:

1. A copying device having a slit-exposure system comprising:
a housing;
a copy stand on the upper portion of said housing and means for reciprocatingly moving said stand;
means for storing, feeding and charging photosensitive material;
means for transferring said photosensitive material between said feeding means and charging means;
means for synchronously moving said copy stand and the photosensitive material;
slit-exposure means provided at a position lower than said storing means;
means for illuminating the original placed on said copy stand;
an L-shaped optical system within the housing for introducing the light image of the illuminated original to the exposure means;
said storing means being placed at the upper portion of the housing and within a space defined by said copy stand and the L-shaped optical system;
a cover for opening and closing the storing means; and means for developing the photosensitive material.

2. The copying device as claimed in claim 1, and additionally comprising:
a blowing duct between said storing means and said L-shaped optical system, said duct being shaped to suction air from outside the housing and deliver said air first to said illuminating means and then to developed photosensitive material; and
heating means associated with said duct intermediate said illuminating means and said photosensitive material.

3. The copying device as claimed in claim 2, wherein said duct is forked in two branches to avoid the light path of said L-shaped optical system, said heating means being in said forked branches.

4. The copying device as claimed in claim 1, wherein said cover is pivoted on a shaft connected to said housing at a point not traversed by said copy stand, whereby movement of said copy stand is not impeded even when said cover is raised.

5. A copying device having a slit-exposure system comprising:
a housing;
a copy stand on the upper portion of said housing and having first and second oppositely disposed end portions and means for reciprocatingly moving said stand along a path essentially perpendicular to said first and second end portions;
means for storing, feeding and charging photosensitive material;
means for transferring said photosensitive material between said feeding means and charging means;
means for synchronously moving said copy stand and the photosensitive material;
means for illuminating the original placed on said copy stand; a stationary optical system within the housing for introducing the light image of the illuminated original to the exposure station, where the light image of the illuminated original is cast upon the photosensitive material;
means for developing the photosensitive material;
said means for reciprocatingly moving said copy stand comprising:
a normal reversal rotation drum;
a belt wound around said drum, one end of said belt being fixed to said first end portion of said copy stand and the other end of said belt being fixed to said second end portion of said copy stand; and
means including a drive shaft for rotating said drum in normal and reverse directions.

6. A copying device having a slit-exposure system comprising:
a housing;
a copy stand on the upper portion of said housing and means for reciprocatingly moving said stand;
means for storing, feeding and charging photosensitive material;
means for transferring said photosensitive material between said feeding means and charging means;
means for synchronously moving said copy stand and the photosensitive material;
means for illuminating the original placed on said copy stand;
a stationary optical system within the housing for introducing the light image of the illuminated original to the exposure station, where the light image of the illuminated original is cast upon the photosensitive material;
means for developing the photosensitive material; said means for synchronously moving said copy stand and the photosensitive material comprise:
means for normally stopping said copy stand at the terminal position of its normal movement and initiating reverse movement;
means for feeding the photosensitive material at a predetermined position in the reverse movement of said copy stand; and
means for synchronously driving the photosensitive material to the slit-exposure position when said copy stand arrives at the illuminating position.

7. The copying device as claimed in claim 6, wherein said means for normally stopping said copy stand is moveable, whereby the terminal position of said copy stand is adjustable in accordance with the size of the original.

8. The copying device as claimed in claim 7, wherein said moveable stopping means is mounted on said copy stand.

9. The copying device as claimed in claim 5, wherein said drum rotating means includes means for absorbing the shock produced when reverse movement of said copy stand is initiated.

10. A copying device having a slit-exposure system comprising:
a housing;
a copy stand on the upper portion of said housing and means for reciprocatingly moving said stand;
means for storing, feeding and charging photosensitive material;
means for transferring said photosensitive material between said feeding means and charging means;
means for synchronously moving said copy stand and the photosensitive material;
means for illuminating the original placed on said copy stand;
a stationary optical system within the housing for introducing the light image of the illuminated original to the exposure station, where the light image of the illuminated original is cast upon the photosensitive material;

means for normally stopping said copy stand at the start position of its normal movement and initiating normal movement responsive to the arrival of the photosensitive material in the slit-exposure position;

means for adjusting the travelling distance of the normal movement of said copy stand in accordance with the size of the original, said travelling distance adjusting means being mounted on said copy stand; and

means for developing the photosensitive material.

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