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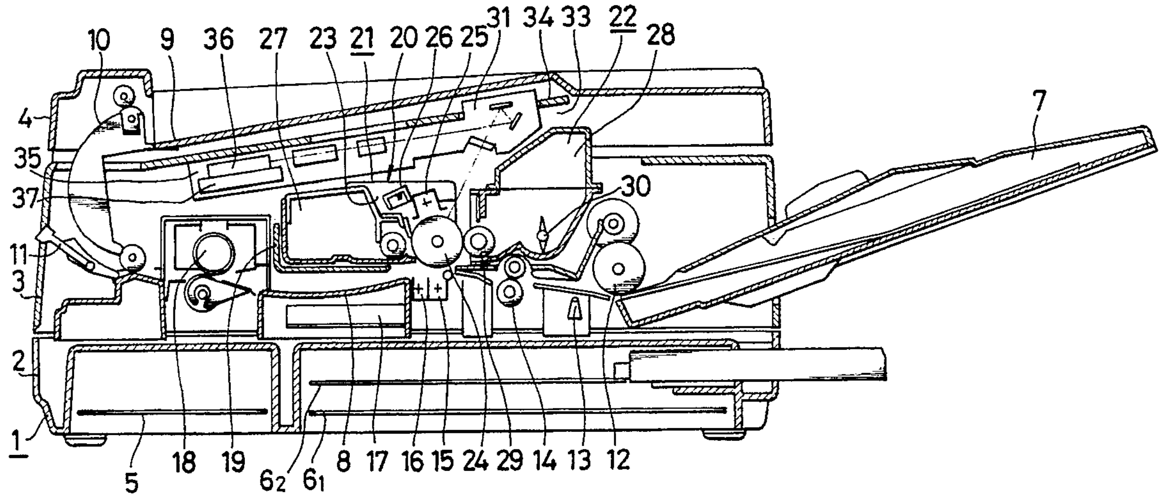
(54) **Electrophotographic copying machine.**

(57) An electrophotographic copying machine which forms an electrostatic latent image on a photoconductive means by charging the image forming surface of the photoconductive means by a charger and scanning the charged image forming surface of the photoconductive means by an exposure unit, develops the electrostatic latent image by a developing unit, and transfers the developed image from the photoconductive means to a recording sheet by a transfer unit. The electrophotographic copying machine is provided with a holding means capable of holding an exposure unit of either of different systems. Thus, the electrophotographic copying machine can be constructed in a desired model by incorporating an exposure unit of a desired system without changing most of the component parts.

FIG. 1



EP 0 427 471 A2

ELECTROPHOTOGRAPHIC COPYING MACHINE

FIELD OF THE INVENTION AND RELATED ART STATEMENT

The present invention relates to an electrophotographic copying machine which develops an electrostatic latent image formed on a photoconductive body and transfers the developed image on a recording medium.

The electrophotographic copying machine charges the outer circumference of the photoconductive body by the charging device and exposes the charged outer circumference of the photoconductive body to light by the exposure device to form an electrostatic latent image on the outer circumference of the photoconductive body. Generally, the exposure device is of a deflection scanning exposure system which scans the outer circumference of the photoconductive body by a light beam emitted by a light source, such as a laser diode, and reflected by a polygonal rotating mirror. Recently, a self-scanning exposure system has been developed. An exposure device of the self-scanning exposure system employs a linear light emitting head formed by linearly arranging a plurality of end emission electroluminescent elements each formed by sandwiching an active thin film, such as a thin film of zinc sulfide containing an active element, between dielectric films, and attaching a pair of electrodes respectively to the dielectric films. Voltage is applied across the individual electroluminescent elements of the linear recording head to project light through the end surfaces of the individual electroluminescent elements on the photoconductive body for exposure.

Exposure devices of various exposure systems have been developed, electrophotographic copying machines of different exposure systems have been marketed, and user's requirements for the exposure system have been diversified. Accordingly, electrophotographic copying machines have been diversified.

Although most parts of the conventional electrophotographic copying machines other than those of the exposure devices, even if they are of different exposure systems, may be interchangeable parts universally applicable to electrophotographic copying machines employing different exposure devices. Nevertheless, electrophotographic copying machines of different exposure systems are designed and manufactured individually, and hence the corresponding parts of such electrophotographic copying machines are not interchangeable, so that the conventional electrophotographic copying machines cannot be efficiently designed and manufactured, and the manufacturing cost and part cost of the conventional electrophotographic copying machines are comparatively high.

The focal length of the linear recording head of the self-scanning exposure device is very short, and hence the allowable range of scatter of distances between the surface of the photoconductive body and the component electroluminescent elements is very narrow. Nevertheless, since the photoconductive body and exposure device of the conventional electrophotographic copying machine are mounted respectively on separate support members, errors in the respective positions of the support members relative to each other increase errors in the respective positions of the light emitting elements relative to the photoconductive body, so that it is difficult to adjust the position of the linear recording head relative to the photoconductive body correctly, so that the light emitting elements of the linear recording head cannot be correctly disposed at a distance corresponding to the focal length from the photoconductive body, which results in irregular illumination of the photoconductive body.

The case of the self-scanning exposure device is positioned with its light emitting section extending perpendicularly to the scanning line. Accordingly, when a rotary photoconductive drum is employed as the photoconductive body, the gap between the circumference of the rotary photoconductive drum and the light emitting section of the case decreases from a portion illuminated by a light beam toward portions remote from the portion illuminated by a light beam with respect to the rotating direction of the rotary photoconductive drum. Consequently, whirling air current induced by the rotation of the rotary photoconductive drum flow through the gap together with dust to contaminate the lens of the exposure device and, consequently, image density is reduced due to the reduction of the intensity of the light beams attributable to the reduction of the transmissivity of the lens.

Since the focal length of the linear recording head is very short, the self-scanning exposure device must be positioned correctly relatively to the photoconductive drum. Various positioning methods of positioning the self-scanning exposure device have been proposed. A positioning method fixes the self-scanning exposure device after positioning the self-scanning exposure device by using a thickness gage, and another positioning method mounts rollers for rotation on the opposite ends of the self-scanning exposure device, positions the self-scanning exposure device with the rollers in contact with the circumference of the photoconductive drum, and then fixes the self-scanning exposure device. The former method using the thickness gage may possibly damage the light projecting surface of the self-scanning exposure device or the image forming layer of the photoconductive drum, and the latter method using the rollers may possibly cause the transmission of vibrations of the photoconductive drum to the self-scanning exposure device to disturb the scanning lines, so that it is impossible to form an image correctly. Thus, either method is not perfectly satisfactory.

OBJECT AND SUMMARY OF THE INVENTION

According, it is a first object of the present invention to provide an electrophotographic copying machine incorporating interchangeable parts.

A second object of the present invention is to provide an electrophotographic copying machine having a compact construction.

A third object of the present invention is to provide an electrophotographic copying machine in which a self-scanning exposure device can be correctly positioned relative to the photoconductive body.

A fourth object of the present invention is to provide an electrophotographic copying machine which prevents the accumulation of dust on a lens attached to the extremity of the light emitting section of the exposure device.

A fifth object of the present invention is to provide an electrophotographic copying machine in which a self-scanning exposure device can be readily positioned without deteriorating the image forming function of the related components.

To achieve the objects, the present provides an electrophotographic copying machine provided with a holding unit capable of holding any one of a plurality of exposure units of different systems including the deflection scanning system and the self-scanning system for forming an electrostatic latent image on a charged photoconductive body by irradiating the photoconductive body with light to enable the electrophotographic copying machine to incorporate an exposure unit of a desired system without changing most of the component parts other than the accessories of the exposure unit employed.

The holding unit is capable of holding any one of the plurality of exposure units of different systems so that the light beam projected by the exposure unit as held on the holding units is focused on a predetermined image forming point on the photoconductive body so that the timing of operations, such as a sheet feeding operation, need not be changed when the exposure unit is replaced with another one.

The holding unit holds a deflection scanning exposure unit, which has a relatively long optical path, within an unutilized space between the photoconductive body and a transfer unit and above a sheet feed unit for feeding sheets, and holds a self-scanning exposure unit, which has a relatively short optical path, over the photoconductive body so that the electrophotographic copying machine can be formed in a compact construction.

Since the respective optical paths of the plurality of exposure units as held by the holding unit coincide with each other, parts other than those of the optical paths can be arranged closely along the outer circumference of the photoconductive body to form the electrophotographic copying machine in a compact construction.

The self-scanning exposure unit and the photoconductive body, such as a photoconductive drum, are mounted on a single supporting unit to reduce errors in the relative positions of the photoconductive body and the exposure unit in assembling the electrophotographic copying machine. The exposure unit is disposed with a portion thereof extending before the photoconductive drum with respect to the rotating direction of the photoconductive drum disposed nearer to the photoconductive drum than a portion thereof extending after the photoconductive drum with respect to the rotating direction of the photoconductive drum to suppress the flow of whirling air current into the gap between the photoconductive drum and the exposure unit so that dust may not accumulate on a lens attached to the extremity of the light emitting section of the exposure unit. A stopper is attached to the case of the exposure unit so as to be moved toward and away from the photoconductive drum and so as to be fixed at an optional position or reference faces are formed on the opposite ends of the case of the exposure unit to enable the adjustment of the distance between the photoconductive body and the extremity of the light emitting section of the exposure unit by means of a thickness gage without deteriorating the image forming function of the related component parts.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a longitudinal sectional view of an electrophotographic copying machine in a first embodiment according to the present invention as equipped with a deflection scanning exposure unit;

Figure 2 is a longitudinal sectional view of the electrophotographic copying machine of Fig. 1 as equipped with a self-scanning exposure unit;

Figure 3 is an enlarged longitudinal sectional view of a supporting structure for supporting a deflection scanning exposure unit;

Figure 4 is an enlarged longitudinal sectional view of a supporting structure for supporting a self-scanning exposure unit;

Figure 5 is a longitudinal sectional view of an electrophotographic copying machine in a second embodiment according to the present invention as equipped with a self-scanning exposure unit;

Figure 6 is a longitudinal sectional view of an electrophotographic copying machine of Fig. 5 as equipped with a deflection scanning exposure unit;

Figure 7 is a longitudinal sectional view of a self-scanning exposure unit;

Figure 8 is a side elevation of the self-scanning exposure unit of Fig. 7;

Figure 9 is a perspective view of the self-scanning exposure unit of Fig. 7;

Figure 10 is a perspective view of a supporting structure for supporting a self-scanning exposure unit;

Figure 11 is a perspective view of a supporting unit; and

Figure 12 is a suppcrting unit supporting a self-scanning exposure unit.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

An electrophotographic copying machine in a first embodiment according to the present invention will be described with reference to Figs. 1 to 4. Referring to Figs. 1 and 2 showing the general construction of the electrophotographic copying machine, a housing 1 comprises a base case 2, an upper case 3 joined to the base case 2, and a top cover 4 hinged at its one side to the upper end of the upper case 3. A power unit 5, a first printed wiring board 6, and a second printed wiring board 6_2 are mounted on the base case 2. The first printed wiring board 6_1 is provided with an exposure unit control circuit for controlling exposure units 31 and 32, and the second printed wiring board 6_2 is provided with a control circuit for controlling the other units. A sheet transporting path 8 for transporting a sheet, i.e., a recording medium, delivered from a sheet feed cassette 7 is formed in the upper case 3. A sheet delivery path 10 along which a sheet is delivered to a delivery tray 9 formed in the upper surface of the top cover 4 is connected to rear end of the sheet transporting path 8. A guide member 11 is provided at the junction of the sheet transporting path 8 and the sheet delivery path 10 to guide a sheet into the sheet delivery path 10 or into the extension of the sheet transporting path 8 terminating on the side wall of the upper case 3. A feed roller 12 normally in contact with the uppermost sheet of sheets piled in the sheet feed cassette 7, an optical sheet sensor 13 for detecting the feed of a sheet, a register roller 14 which is controlled by a detection signal provided by the sheet sensor 13, a transfer unit 15 for transferring a developed cage from a photoconductive drum 24 to a sheet, a static eliminator 16 for eliminating static charge remaining on a sheet, a high tension power unit 17, and a fixing unit 18 for fixing an image transferred from the photoconductive drum 24 to a sheet by the transfer unit 15 to the sheet are arranged sequentially in that order along the sheet transporting path 8 from the front end to the rear end of the sheet transporting path 8.

A basket 19 having upper and lower open ends is mounted on the upper case 3 over the sheet transporting path 8, and an image forming unit 20 consisting of a photoconductive drum unit 21 and a developing unit 22 is contained removably in the basket 19. The photoconductive drum unit 21 comprises a frame 23, the photoconductive drum 24 journaled on the side walls of the frame 23, a charger 25 for charging the photoconductive drum 24, a static eliminator 26 for leveling the charge on the circumference of the photoconductive drum 24 by illumination, and a cleaning unit 27. The developing unit 22 comprises a toner container 28 containing a toner, a developing roller 29 and a stirrer 30 for stirring the toner contained in the toner container 28.

A housing chamber 33 is formed in the upper portion of the housing 1 to contain either of exposure units 31 and 32 of different systems selectively, and a base plate 34 is provided fixedly in the housing chamber 33 to mount either the exposure unit 31 or 32 selectively.

As shown in Figs. 1 and 3, the exposure unit 31 is constructed by mounting a light source, not shown, such as a laser diode, a polygonal rotating mirror 36, a motor 37 for driving the polygonal rotating mirror 36 for rotation, an $f\theta$ lens 38, reflecting mirrors 39 and a cylindrical lens 40 on a frame 35. The frame 35 is fastened to the base plate 34 with screws 41. The exposure unit 31 is of a deflecting scanning system, in which the polygonal rotating mirror 36 deflects a laser beam emitted by the light source, the $f\theta$ lens condenses the laser beam, the reflecting mirror 39 reflects the condensed laser beam, and the cylindrical lens 40 corrects the optical axis to scan the circumference of the photoconductive drum 24 by the laser beam.

As shown in Figs. 2 and 4, the self-scanning exposure unit 32 comprises a frame 42 fastened to the base plate 34 with screws 41 and having an inclined end wall declining toward the photoconductive drum 24, a plate 44 fastened to the inclined wall 43 with screws 45, a linear light emitting head

46 attached to the lower end of the plate 44, a printed wiring board 48 mounted with circuit devices 47 and fastened to the plate 44 with screws 49, a flexible cable 51 electrically interconnecting the printed wiring board 48 and the linear light emitting head 46, and a printed wiring board 53 mounted with circuit devices 52 and fastened to the frame 42 with screws 54. Indicated at 50 is a spacer. The printed wiring boards 48 and 58 are connected electrically to the printed wiring boards 6_1 and 6_2. The linear light emitting head 46 is formed by linearly arranging a plurality of end emission electroluminescent elements. Each end emission electroluminescent element is formed by sandwiching an active thin film, such as a thin film of zinc sulfide containing an active element, between dielectric thin films and attaching electrodes respectively to the dielectric thin films. Voltage is applied individually across the pairs of electrodes to make the end emission electroluminescent elements emit light individually. Slots 55 for receiving the screws 45 therethrough are formed in the inclined wall 43 of the frame 42 so that the plate 44 can be moved along the inclined wall 44 and fastened to the same at an optional position in adjusting the gap between the linear light emitting head 46 and the circumference of the photoconductive drum 24. The respective image forming points of the exposure units 31 and 32 as disposed in the housing chamber 33 on the circumference of the photoconductive drum 24 coincide with each other.

The photoconductive drum 24 turns one full turn, the charger 25 charges the photoconductive drum 24, the exposure unit 31 or 32 scans the charged circumference of the photoconductive drum 24 to form an electrostatic latent image on the circumference of the photoconductive drum 24 and the developing unit 22 develops the electrostatic latent image in each image forming cycle. On the other hand, the feed roller 12 pulls out a sheet from the sheet feed cassette 7. The timing of operation of the register roller 14 is controlled by a detection signal provided by the sheet sensor 13. The register roller 14 is actuated by a detection signal provided by the sheet sensor 13 upon the detection of the leading edge of the sheet to feed the sheet to the photoconductive drum 24 in predetermined timing. Then, the developed image is transferred from the photoconductive drum 24 to the sheet by the agency of the transfer unit 15, and then the developed image is fixed to the sheet by the fixing unit 18. The guide member 11 is controlled so as to guide the sheet toward an outlet opening formed in the side wall of the upper case 3 or toward the delivery tray 9 through the delivery path 10.

Thus, the electrophotographic copying machine can be equipped selectively with either the deflection scanning exposure unit 31 or the self-scanning exposure unit 32 without changing most of the component parts other than the component parts specifically associated with the deflection scanning exposure unit 31 and the self-scanning exposure unit 32, such as the printed wiring board 6_1 for the self-scanning exposure unit 32. Thus, the electrophotographic copying machine can be constructed in different models without increasing the kinds of parts, which facilitate production management. Since the respective image forming points of the exposure units 31 and 32 as disposed in the housing chamber 33 on the circumference of the phoconductive drum 24 coincide with each other, the timing of sheet feed operation need not be changed for either the exposure unit 31 or the exposure unit 32. Therefore, the printed wiring board 6_2 can be used in common to both the exposure units 31 and 32.

Since the optical path is fixed with respect to the photoconductive drum 24 when the electrophotographic copying machine is equipped with either the exposure unit 31 or the exposure unit 32, the parts of the units other than those of the exposure unit 31 or 32 can he arranged closely, so that the electrophotographic copying machine can be formed in a compact construction.

Since the printed wiring board 48 for the exposure unit 32 and the linear light emitting head 46 are held in the same plane, the cable 51 electrically interconnecting the printed wiring board 48 and the linear light emitting head 36 is not subjected to an excessive force and hence the life of the cable 51 is extended without requiring any special reinforcing member.

An electrophotographic copying machine in a second embodiment according to the present invention will be described hereinafter with reference to Figs. 5 to 12. Referring to Figs. 5 and 6 showing the general construction of the electrophotographic copying machine, a housing 101 comprises a base case 102 and an upper case 103 joined to the base case 102. A tray 105 is put detachably on the rear side wall of the housing 101 near an outlet opening 104. Another tray 106 is held detachably and pivotally in the upper portion of the upper case 103. A sheet transporting path 110 is formed within the housing 101 to transport a sheet 109 pulled out from a sheet feed cassette 107 or 108. A sheet delivery path 111 is joined to the rear end of the sheet transporting path 110 to deliver the sheet 109 to the tray 106. A guide member 112 is provided pivotally at the junction of the sheet transporting path 110 and the sheet delivery path 111 to guide the sheet 109 toward the sheet delivery path 111 or toward the tray 105. Feed rollers 113 and 114 in contact respectively with the uppermost sheets 109 of piles of sheets contained respectively in the sheet feed cassettes 107 and 108, a transfer unit 115 fro transferring a developed image from a photoconductive drum 121 to the sheet 109, a static eliminator 116 for eliminating charge remaining on the sheet 109, and a fixing unit 117 for fixing the developed image to the sheet 109 are arranged sequentially in that order along the sheet transporting path 110.

As shown in Fig. 11, a photoconductive drum unit 119 and a developing unit 120 are held on a holding frame 118 provided within the housing 101. The photoconductive drum unit 119 comprises the photoconductive drum 121 journaled on the side walls of the holding frame 118, a charger 122 for charging the photoconductive drum 121, a static eliminator 123 for uniformly charging the circumference of the photoconductive drum 121 by illumination, and a cleaning unit 124.

The housing 101 is provided with a first housing chamber 126 above the sheet feed cassette 107 to contain, when required, a deflection scanning exposure unit 125, and a second housing chamber 128 to contain, when required, a self-scanning exposure unit 127. The first housing chamber 126 is provided fixedly with a holding plate 129 for holding the exposure unit 125. The holding frame 118 is fixedly provided with a holding plate 130 projecting into the housing chamber 128 to hold the exposure unit 127. As shown in Fig. 6, the exposure unit 125 is constructed by attaching a light source, not shown, such as a laser diode, a polygonal rotating mirror 132, a motor 132a for driving the polygonal rotating mirror 132 for rotation, and an fθ lens 133 to a frame 131. The frame 131 is fastened, when required, to the holding plate 129 with screws 134. The exposure unit 125 is of a deflection scanning system which deflects a laser beam emitted by the light source by the polygonal rotating mirror 132, condenses the deflected laser beam by the fθ lens 133, and reflects the condensed laser beam by a reflecting mirror fixed to the holding plate 130 on the circumference of the photoconductive drum 121.

As shown in Fig. 5, the self-scanning exposure unit 127 is fastened, when required, to the holding plate 130 with screws 134. As shown in Fig. 7, the self-scanning exposure unit 127 comprises a case of a cross section having a shape resembling the letter L and formed of a synthetic resin, a linear light emitting head 140 provided with a plurality of end emission electroluminescent elements 139 arranged on a printed wiring board 141 along a line parallel to the scanning line on the circumference of the photoconductive drum 121 and contained in the case 136, a printed wiring board 143 mounted with a driving circuit 142 disposed in a substantially horizontal position within the case 136, a flexible cable 144 electrically interconnecting the linear light emitting head 140 and the driving circuit 142, and a lens 145 adhesively attached to the open end of the case 136. The case 136 is constructed by welding together two split case members 137 and 138. The lens 145 is attached adhesively to the case 136 after thus assembling the same. The linear light emitting head 140 and the printed wiring board 143 are positioned by and fixed to a projection 146 formed on the case member 137. The opposite ends of the flexible cable 144 are held between the projection 146 and the linear light emitting head 140 or the printed wiring board 143. An inclined surface 147 inclined to a straight line perpendicular to the scanning direction of the linear light emitting head 140 is formed in the extremity of the light emitting section of the case 136. The inclined surface 147 is declined in a direction reverse to the rotating direction of the photoconductive drum 121. Accordingly, the edge of the rear wall 147a of the light emitting section with respect to the rotating direction of the photoconductive drum 121 is closer to the circumference of the photoconductive drum 121 than the edge of the front wall of the light emitting section. As shown in Fig. 9, reference faces 148 are formed opposite to the circumference of the photoconductive drum 121 respectively in the opposite ends of the light emitting section of the case 136. As shown in Fig. 10, lugs each provided with a vertical slot 150 project respectively from the upper opposite ends of the light emitting section of the case 136. Screws 134 are screwed through the slots 150 in the holding plate 130 to fasten the case 136 to the holding plate 130. Eccentric cams 152 are fixed to the opposite sides of the case 136 with screws 151, respectively. The holding plate 130 is fixed to the holding frame 118 with screws 153.

The photoconductive drum 121 is charged by the charger 122, the exposure unit 125 or 127 scans the charged circumference of the photoconductive drum 121 with a light beam to form an electrostatic latent image on the circumference of the photoconductive drum 121, and the developing unit 120 develops the electrostatic latent image in each image forming cycle. On the other hand, the feed roller 113 (114) pulls out a sheet 109 from the sheet feed cassette 107 (108) and feeds the sheet 109 to the photoconductive drum 121. The transfer unit 115 transfers the developed image from the photoconductive drum 121 to the sheet 109, the fixing unit 117 fixes the developed image to the sheet 109, and then the sheet 109 is guided by the guide member 112 toward either the tray 105 or 106.

The photoconductive drum 121 and the self-scanning exposure unit 127 are mounted on the holding frame 118. Accordingly, the exposure unit

127 and the photoconductive drum 121 can be positioned relative to each other in a high accuracy, so that the irregular illumination of the circumference of the photoconductive drum 121 attributable to irregularity in the focal lengths can be prevented.

When the photoconductive drum 121 is rotated in a direction indicated by an arrow in Fig. 7, clockwise whirling air currents are induced. However, since the inclined surface 147 formed at the extremity of the light emitting section of the case 136 of the exposure unit 127 is declined to the rear with respect to the direction of flow of the whirling air currents, the edge of the side wall 147a is closer to the circumference of the photoconductive drum 121 than the edge of the side wall 147b, and the angle between the inclined surface 147 and the rear wall of the light emitting section of the case with respect to the rotating direction of the photoconductive drum 121 is an acute angle, the flow of the whirling air currents into the gap between the circumference of the photoconductive drum 121 and the exposure unit 127 is suppressed and, consequently, the accumulation of dust contained in the whirling air currents on the lens 145 of the exposure unit 127 is suppressed. Accordingly, the transmissivity of the lens 145 is not reduced and hence the reduction of image density can be prevented. The inclined surface 147 need not necessarily formed at the extremity of the light emitting section of the case 136; the accumulation of dust on the lens 145 can be satisfactorily suppressed only when the edge of the rear wall 147a of the light emitting section of the case 136 is closer to the circumference of the photoconductive drum 121 than the front wall 147b of the same.

In assembling the electrophotographic copying machine, either the deflection scanning exposure unit 125 or the self-scanning exposure unit 127 can be selectively attached to the holding plate 129 or 130 Thus, the electrophotographic copying machine can be constructed in different models without increasing the kinds of parts, which facilitates production management. The deflection scanning exposure unit 125 having a relatively long optical path can be disposed in an unutilized space over the sheet feed cassette 107, and the self-scanning exposure unit 127 having a relatively short optical path can be disposed over the photoconductive drum 121 without requiring any additional space. Since the printed wiring board 143 provided with the driving circuit 142, and the linear light emitting head 140 are arranged with an acute angle therebetween, the exposure unit 127 has a relatively small overall height, so that the housing 101 can be formed in a relatively small height. Since the opposite ends of the flexible cable 144 are held between a projection 146 formed on the inner surface of the case 136 and the printed wiring board 143 or the linear light emitting head 140, the opposite ends of the flexible cable 144 can be securely connected to the linear light emitting head 140 and the printed wiring board 143 even if the flexible cable is curved.

A manner of adjusting the optical path length of the self-scanning exposure unit 127 will be described hereinafter. The angular position of each of the eccentric cams 152 of the exposure unit 127 is adjusted by means a jig, not shown, before incorporating the exposure unit 127 into the housing 101. The jig has first contact surfaces to be placed in contact with the eccentric cam 152, and second contact surfaces to be placed in contact with the extremity of the light emitting section of the case 136. The distance between the first contact surfaces and the corresponding second contact surfaces is fixed. The jig is combined with the exposure unit 127 with the second contact surfaces in contact with the extremity of the light emitting section of the exposure unit 127, the screws 151 are loosened, the eccentric cams 15 are turned to bring the same into contact with the corresponding contact surfaces of the jig, and then the screws 151 are fastened to fix the eccentric cams 152 in place. Thus, the distance between a portion of the circumference of each eccentric cam 152 to be in contact with the holding plate 130 and the extremity of the light emitting section of the case 136 is adjusted to a predetermined distance A (Fig. 8). Suppose the focal length of the linear light emitting head 140 is B (Fig. 7), the distance between the end emission electroluminescent elements 139 and the extremity of the light emitting section of the case 136 is C, the distance between the extremity of the light emitting section of the case 136 and the circumference of the photoconductive drum 121 is D, and the distance between the circumference of each eccentric cam 152 and the circumference of the photoconductive drum 121 is E. Then, D = B - C. Since the linear light emitting head 140 is positioned by the projection 146, the distance C is accurate, and the focal lengths B can be correctly adjusted. Since the distance between the circumference of each eccentric cam 152 and the extremity of the light emitting section of the case 136 is adjusted correctly to the distance A by means of the jig, the distance between the extremity of the light emitting section of the case 136 and the circumference of the photoconductive drum 121 can be accurately adjusted to the distance D (= E - A) simply by disposing the exposure unit 127 with the circumferences of the eccentric cams 152 in contact with the holding plate 130 and screwing the screws 134 through the slots 150 in the holding plate 130.

The angular position of each eccentric cam cording to Claim 6, wherein the holding structure holds the exposure unit so as to be moved toward and away from the photoconductive means, and the case of the exposure unit is provided at its opposite ends with reference faces formed at a predetermined distance from the light emitting means of the exposure unit so as to be positioned at a predetermined distance from the image forming surface of the photoconductive means.

FIG.1

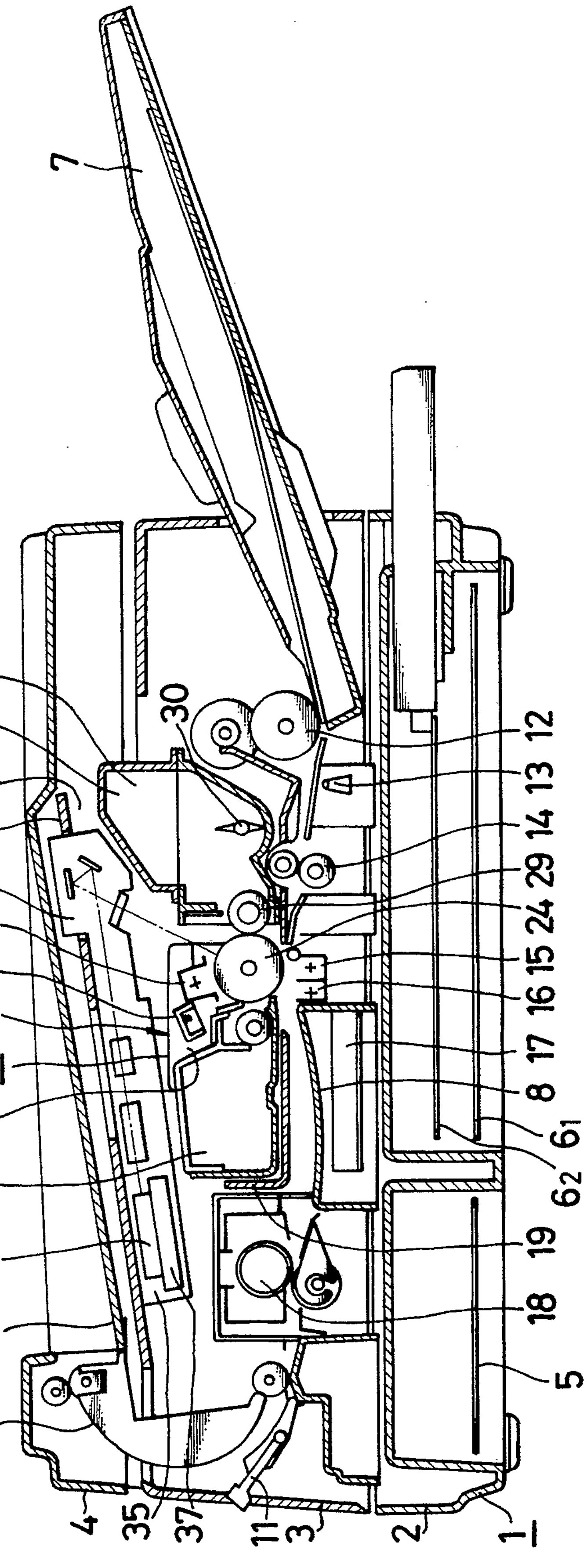


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FIG. 2

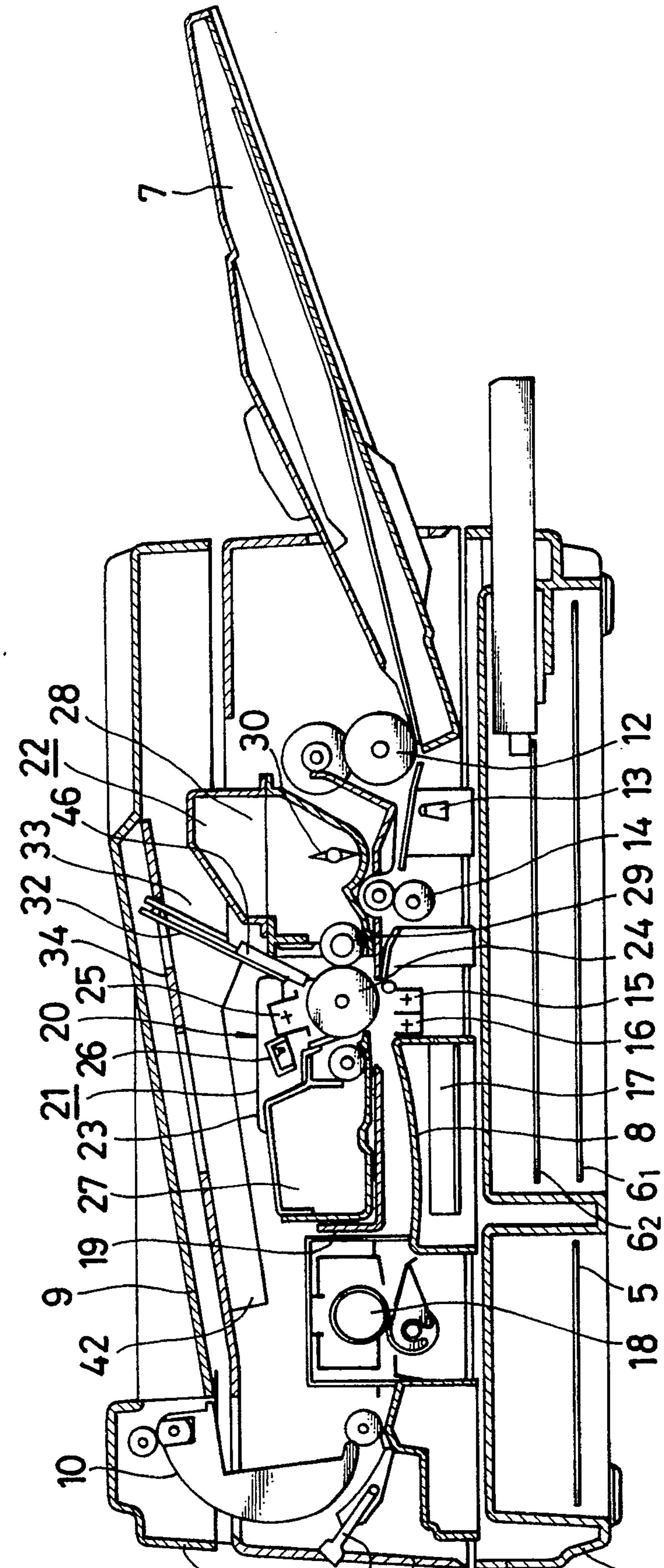
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FIG.3

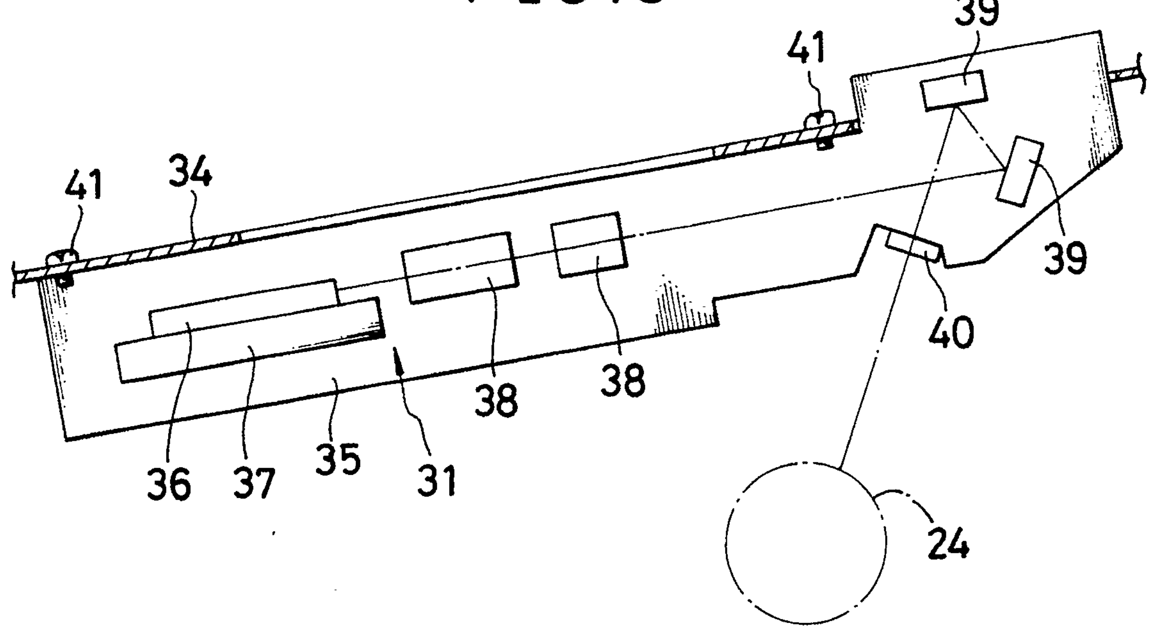
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FIG.4

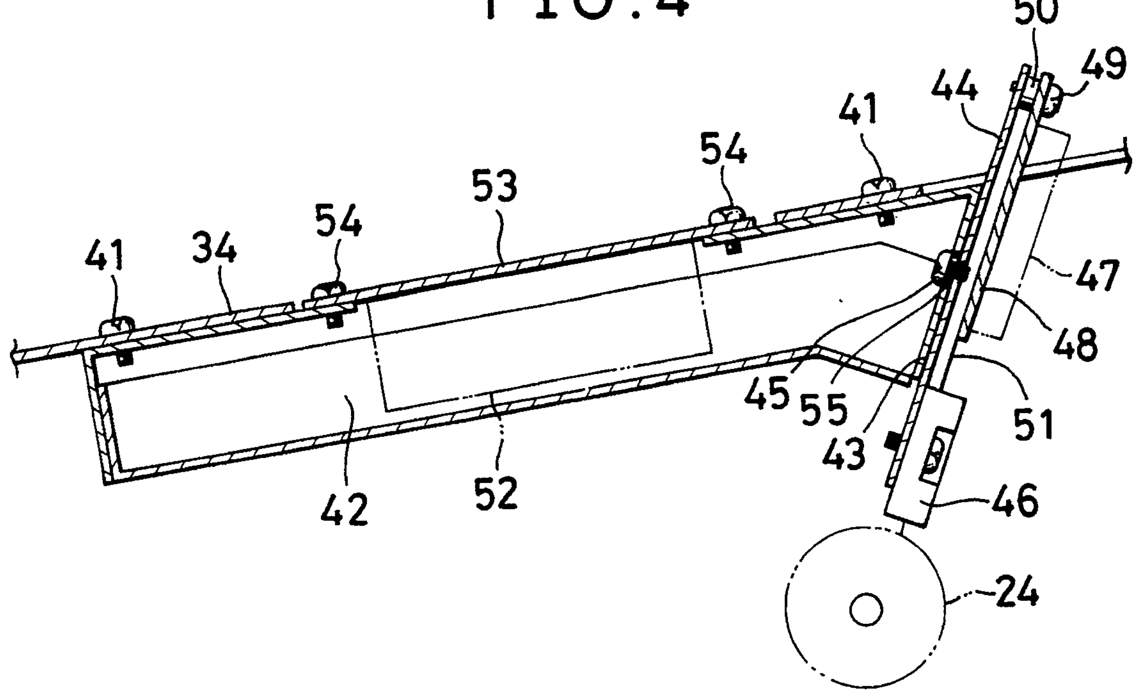
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FIG. 5

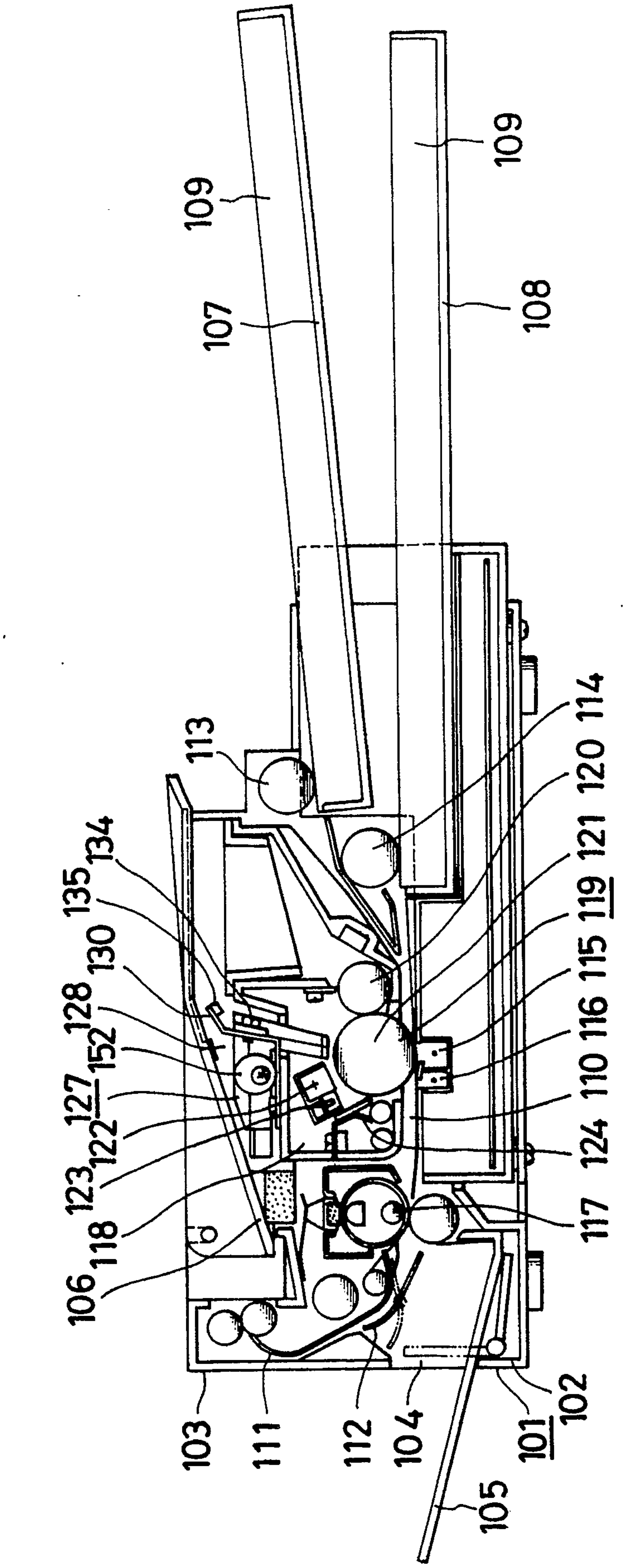
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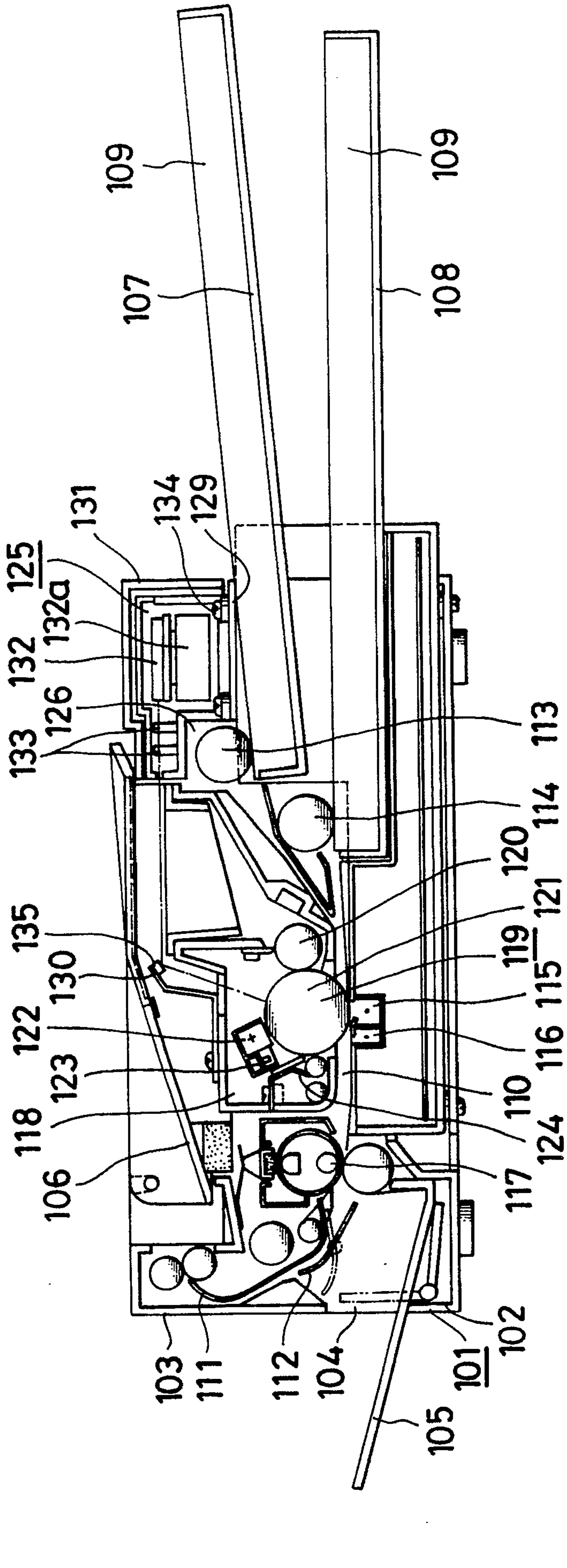
FIG. 6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135

FIG.7

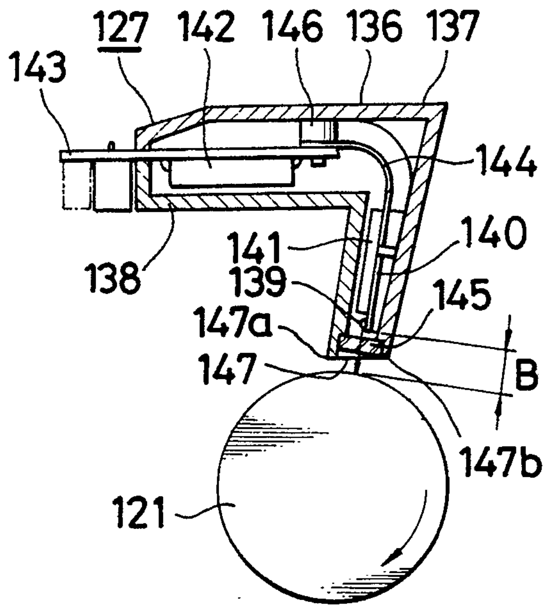
127
142
146
136
137
143
144
140
141
139
138
145
147a
147
B
147b
121

FIG.8

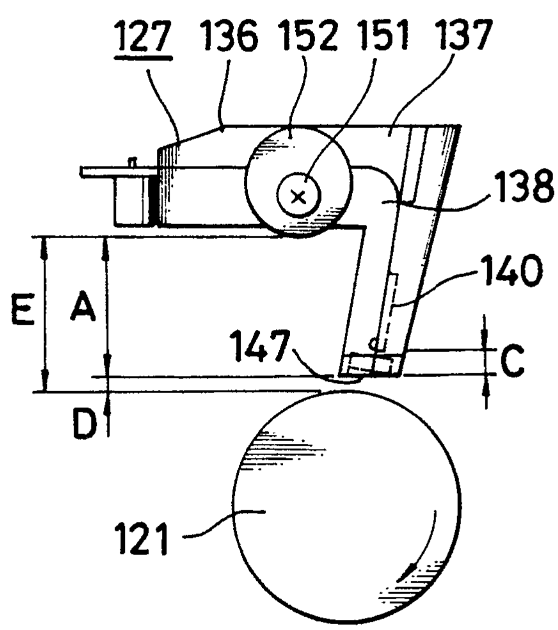
127
136
152
151
137
138
140
E
A
147
C
D
121

FIG.9

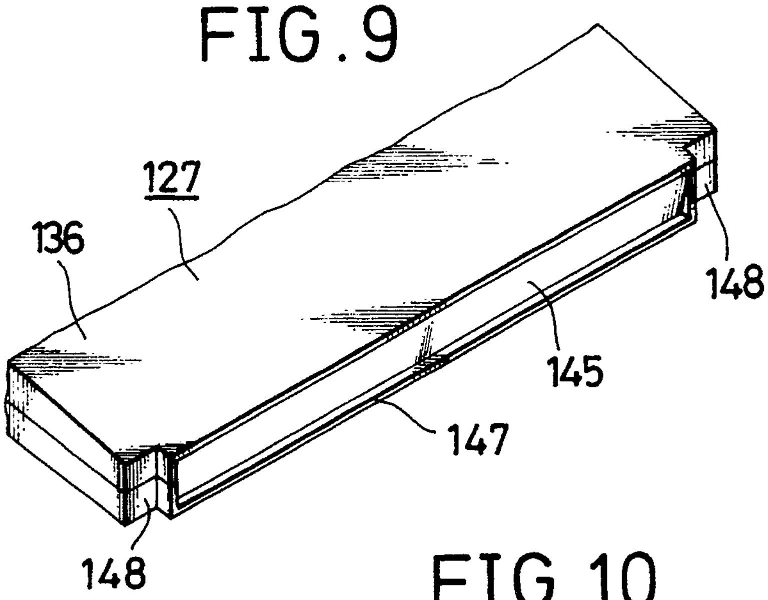
127
136
148
145
147
148

FIG.10

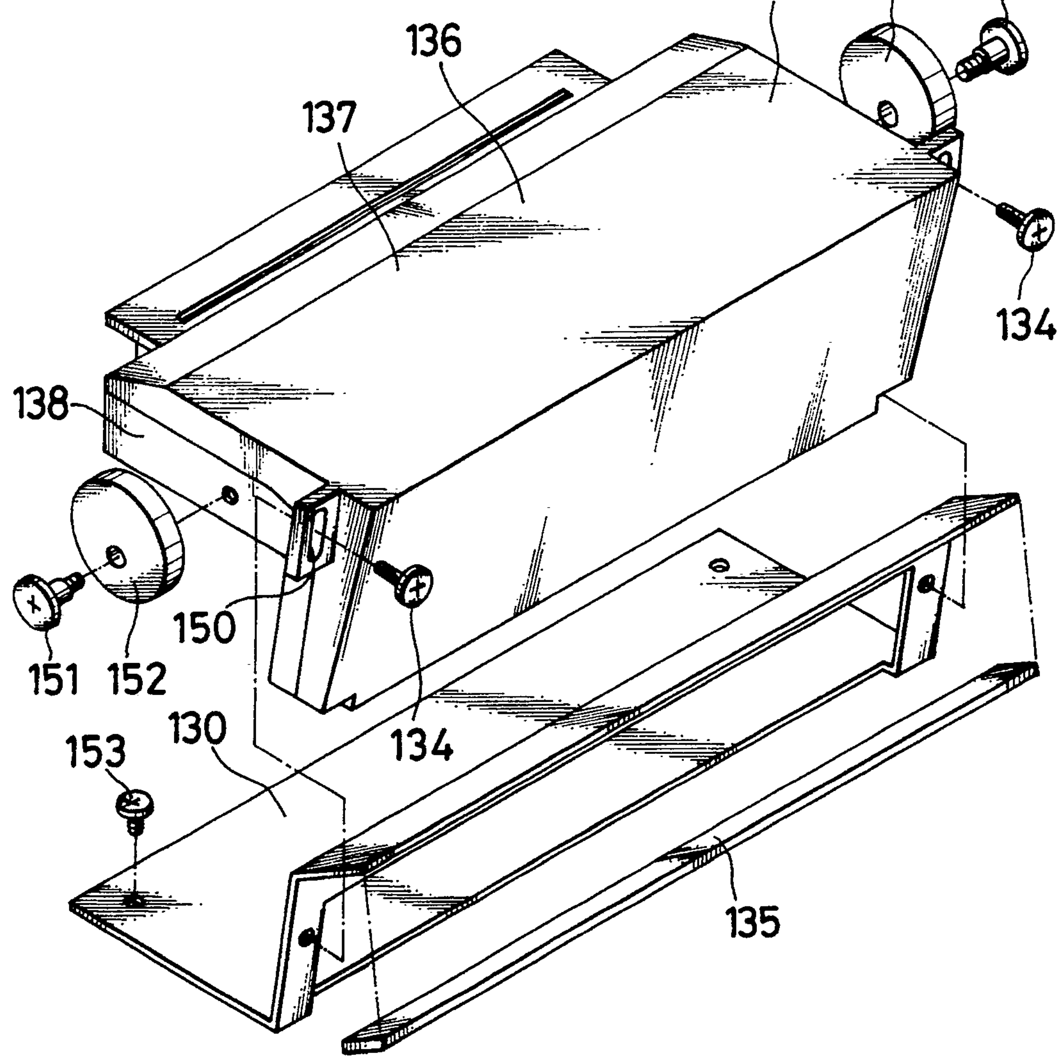
127
152
151
136
137
134
138
150
134
151
152
153
130
135

FIG.11

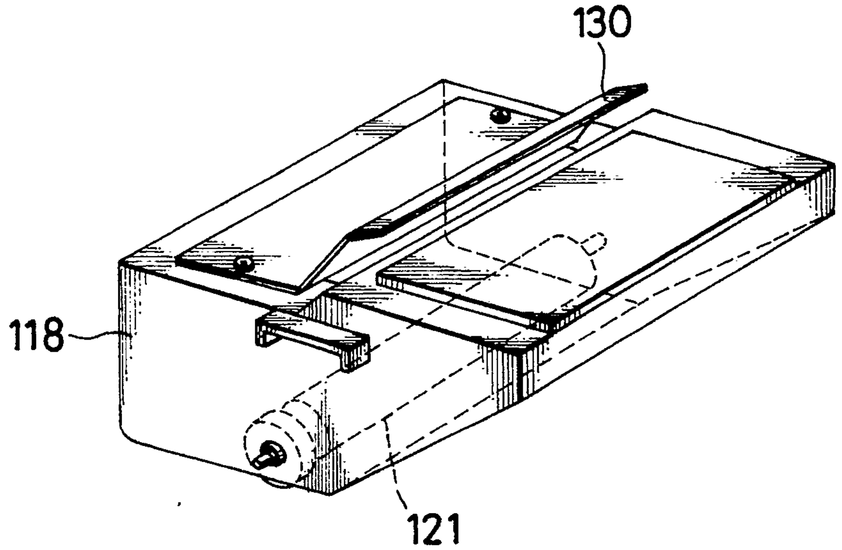

FIG.12