United States Patent [19]

Limberger

[11] **3,740,139**

[45] **June 19, 1973**

[54] **COPYING APPARATUS**

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[22] Filed: **Dec. 8, 1971**

[21] Appl. No.: **205,965**

[30] **Foreign Application Priority Data**

Dec. 8, 1970 Germany ..... P 20 60 276.0

[52] **U.S. Cl.** **355/100**

[51] **Int. Cl.** **G03b 27/30**

[58] **Field of Search** 355/28, 29, 97, 99, 355/100

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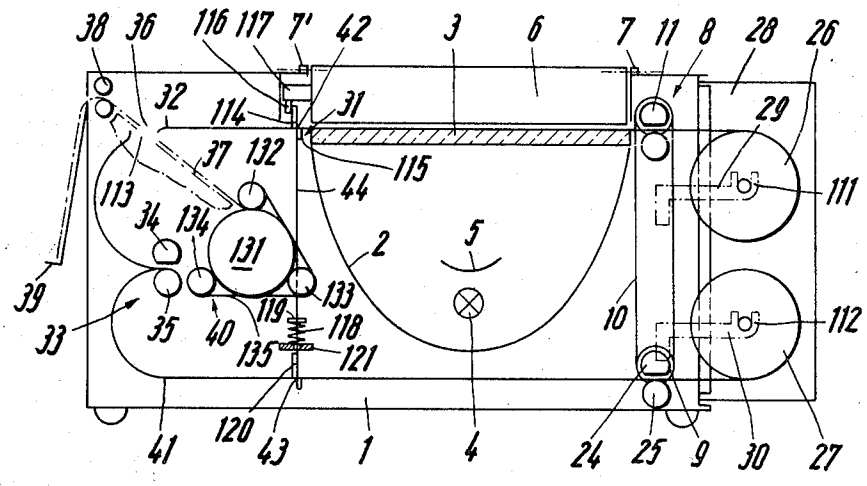
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Primary Examiner—Samuel S. Matthews
Assistant Examiner—Fred L. Braun
Attorney—Toren and McGeady

[57] **ABSTRACT**

An improved copying apparatus, operating with a transfer and a receiving material, which are brought in contact with each other, wherein one material, and preferably the transfer material, is stored as a band on a reel, and a cutting device is mounted in the apparatus, and wherein, viewed in the direction of processing, a developing section is arranged downstream of the exposure section, and the band-shaped transfer material is pulled over an exposure plate and is combined with the receiving material upstream or in front of the exposure section. More particularly, the invention relates to a copying apparatus with a vertically movable contact pressure cover over the exposure plate, and co-acting therewith, and to the construction and arrangement of the guillotine and the transport mechanisms. Also the receiving material may be stored in the form of sheets in a stack. In particular, the invention also aims at providing a copier in compact form.

8 Claims, 11 Drawing Figures



Patented June 19, 1973 3,740,139

6 Sheets-Sheet 1

Fig. 1

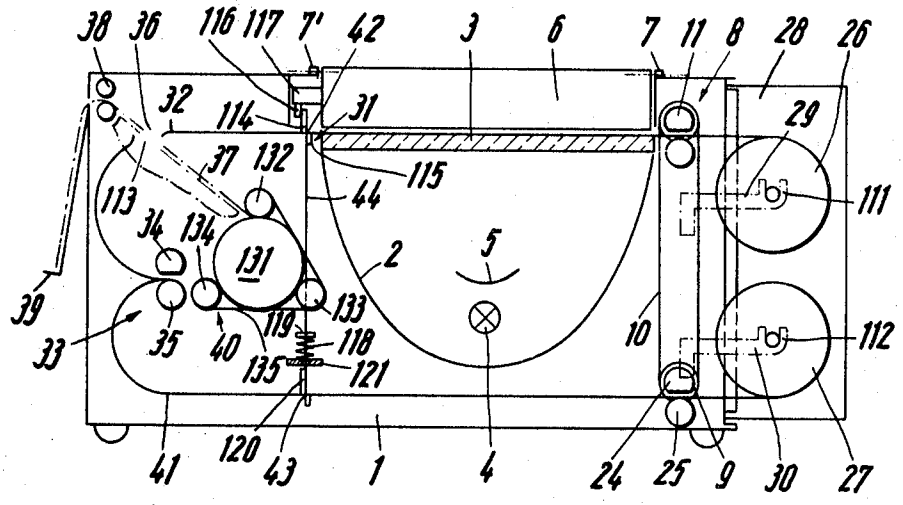


Fig. 2

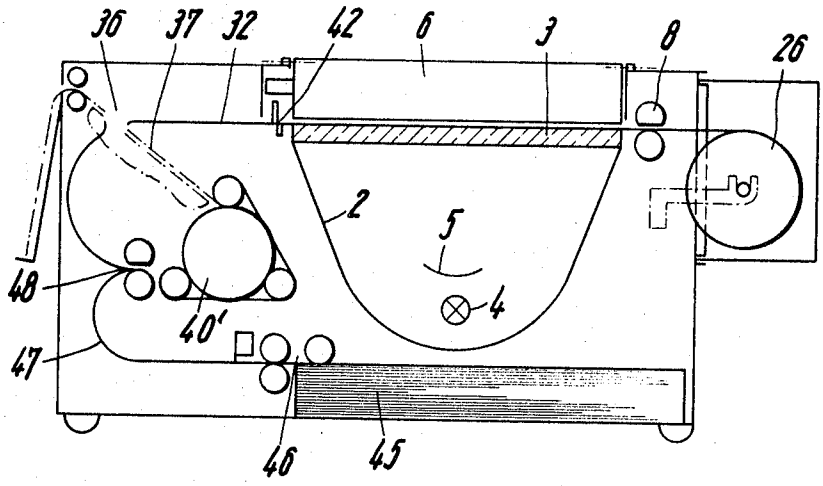

36
37
32
42
6
3
8
26
2
5
4
48
40'
47
46
45

Fig. 3

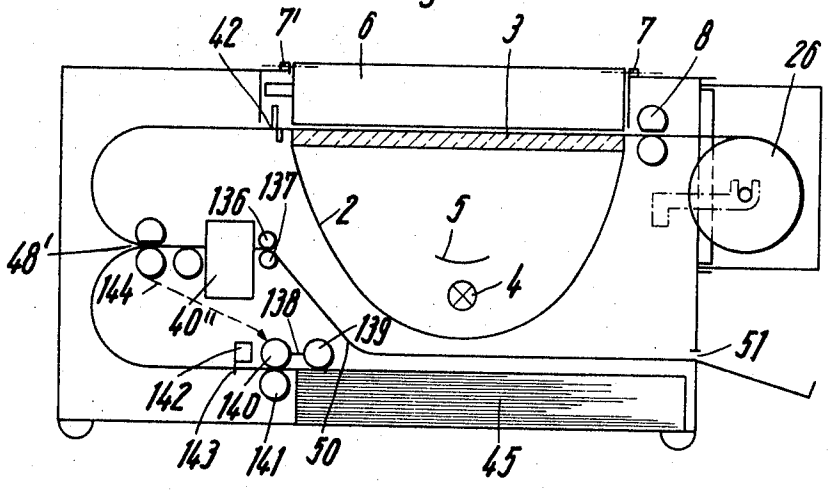
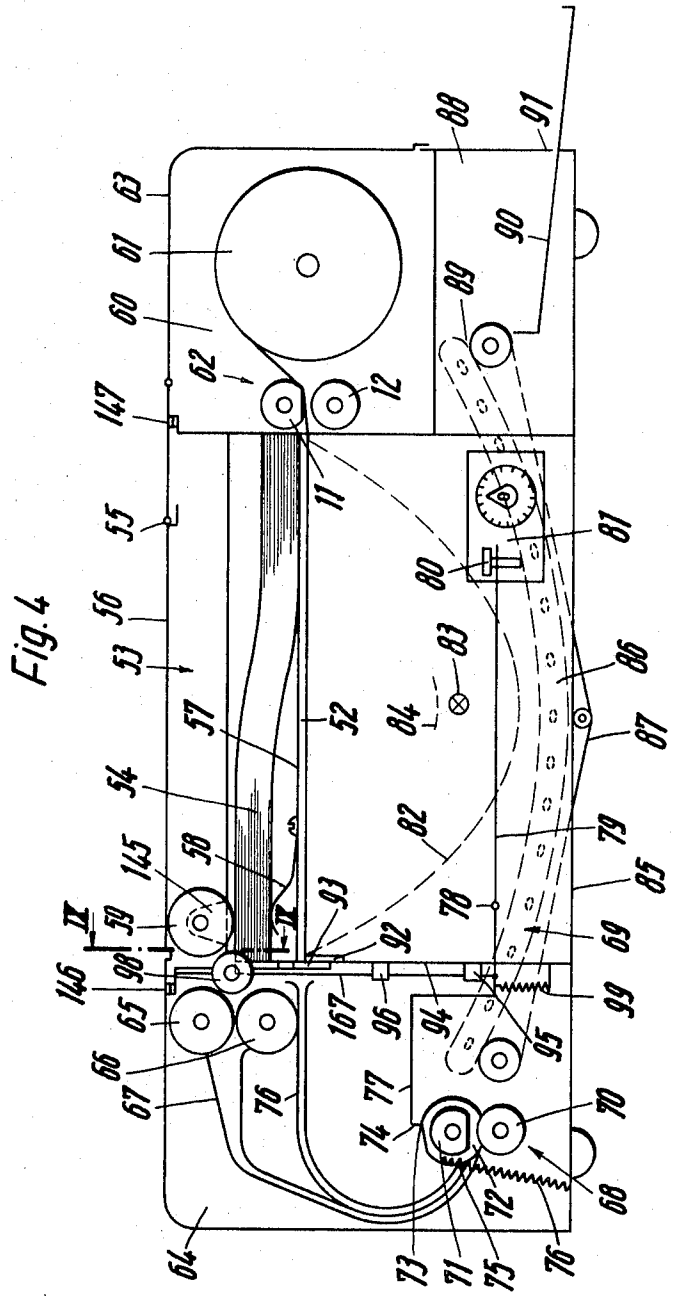

42
7'
6
3
7
8
26
136
137
2
5
4
48'
144
40"
138
139
51
142
140
143
141
50
45

Fig. 4


88
91
63
61
90
60
89
62
12
147
11
55
81
80
56
53
83
86
57
52
84
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54
82
79
145
58
85
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93
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146
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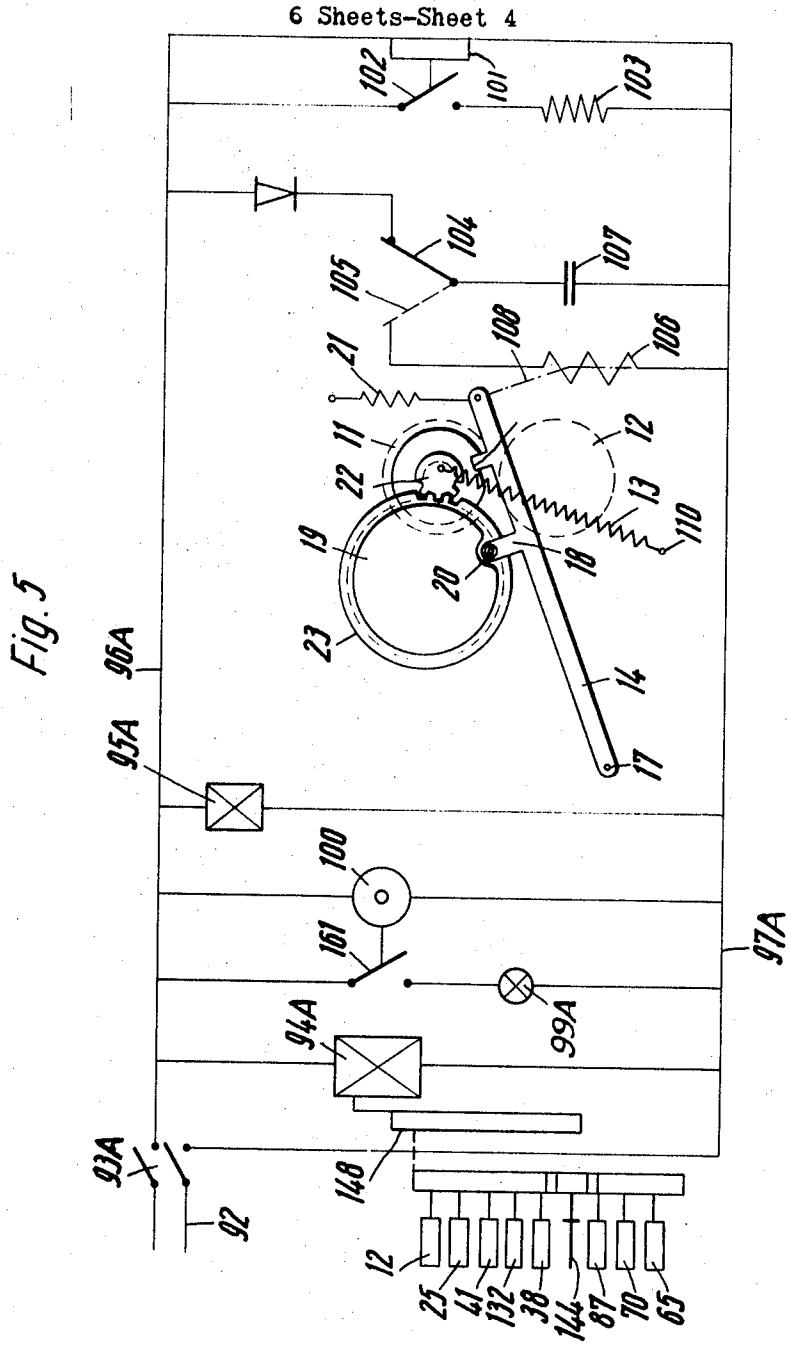
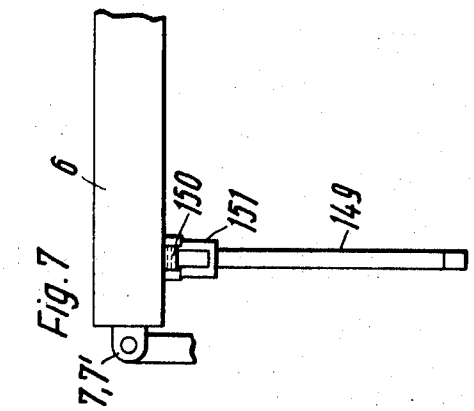
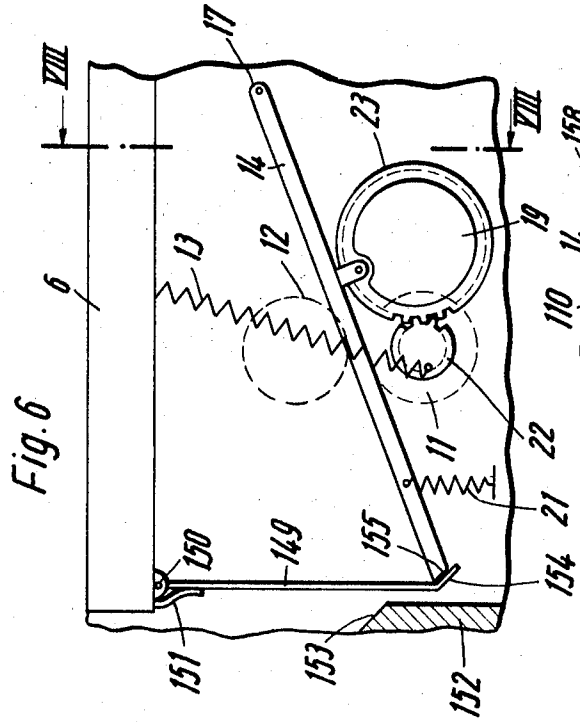

102
101
103
104
105
107
108
106
21
11
22
12
13
110
19
18
20
23
14
17
96A
95A
100
161
97A
99A
94A
93A
92
148
12
25
41
132
38
144
87
70
63

Fig. 5


Fig. 7
6
150
151
149
7,7'


Fig. 6
VIII
VIII
17
23
14
12
13
6
19
22
11
21
155
154
149
150
151
153
152

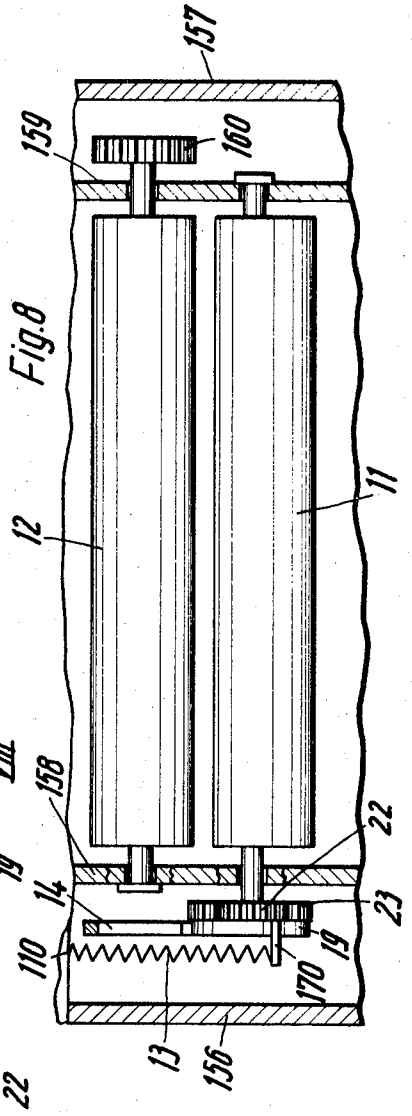

Fig. 8
157
159
160
12
11
158
22
14
23
110
19
170
13
156

Fig. 9

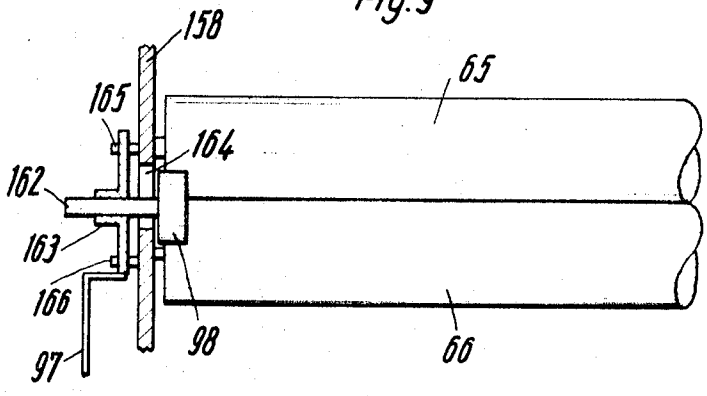


Fig. 10

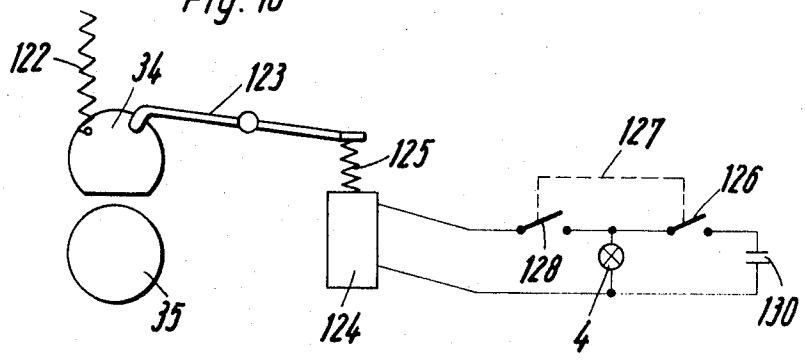
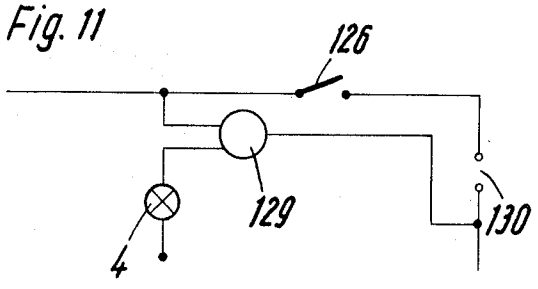


Fig. 11



COPYING APPARATUS

BACKGROUND OF THE INVENTION

In known copying apparatus, the cutting device or guillotine consists of a pair of cutter blades with a fixed blade and one moving blade, preferably with sloping edge. In these devices, particularly operating with a stack of sheets and a contact pressure cover, joints are provided for the contact pressure cover with a pivot located transversely to the direction of movement of the materials. In this construction, the operation of the cover and the placing in position of the original are complicated. Apart from that, on the side of the cover on which the pivot is mounted, the construction of the apparatus is ill-conceived. Known copying apparatus of the kind to which the invention relates require comparatively long cycle periods for one copying process, because the exposure device is released only after the production of a copy, unless expensive controls, coupling and actuating mechanisms are provided for the separate working of the exposure and developing sections.

SUMMARY OF THE INVENTION

It is an object of the invention to provide a copying apparatus with improved control and consequent saving in time.

It is a further object of the invention to provide a copying apparatus with improved control, in which copies may be made in two steps, namely the exposure and the development steps, but in which the second or developing step does not entail an additional delay in the readiness of the apparatus for a further step.

It is a further object of the invention to provide an apparatus of the type hereinbefore mentioned with a particularly convenient hinging of the cover in order to facilitate the operation achievement of a compact construction of the apparatus, even with the stack of sheets and the withdrawing means for the sheets mounted under the cover.

According to the invention, these objects are realized by providing cutting devices and transport means, actuated by switching on the exposure device or in conjunction with the exposure device being switched on, and wherein during the cutting step for the at least one band-shaped material and the other material, the two combined materials are transported through the developing section during a following exposure step.

According to a preferred embodiment of the invention, if a contact pressure cover is used when the cover is closed for a further exposure step, both materials are transported through the developing section, and the movement of the contact pressure cover of the exposure device is used for controlling transport means in the region of the developing section.

Preferably, a location is provided as a defined position of the copying edge between the exposure device and developing device and actuable transport means are provided at the said location which are adapted to be actuated during the subsequent exposure by the movement of the cover and/or the exposure circuit.

Both the transfer material and the receiving material may be provided in the form of reels; in this case, transport means of identical construction and interconnected by drive means, are provided downstream of the reels and these are followed by at least one cutting device or guillotine for the materials.

In this arrangement, the transport means are mounted in the region of one edge of the exposure device, and the cutting device is mounted in the region of the other edge.

According to another embodiment of the invention, the receiving material is provided in the form of a stack of sheets, arranged preferably with a dispensing mechanism in the contact pressure cover of the exposure device. This makes possible the use of comparatively simple paper guides to the exposure device.

According to another preferred embodiment of the invention, the receiving material is provided in the form of a stack of sheets with a dispenser under the exposure device. In this arrangement, the sheets must be transported to the exposure device along a track other than that for the transfer material.

According to a further feature of the copier according to the invention, a curved guide element is provided behind the exposure plate, leading to a drive mechanism, e.g., at half-height, in front of the developing section, and a corresponding guide element is provided from the path under the exposure device to the drive mechanism for the receiving material, wherein one of the said guide elements has a break therein for extracting the sheets combined in the exposure device. This enables a delivery slot to be provided in the upper part of a housing wall which improves the operation generally and makes it possible to provide a sloping delivery platform for the copies, thereby saving space.

According to another embodiment of the invention, with a stack of foliate receiving material being arranged under the exposure device, a delivery channel is provided across the stack of paper towards the side of the apparatus which contains a store for the transfer material.

In a particularly preferred embodiment of the invention, the drive mechanism is actuable in the ready position in front of the developing section as a function of an operation of the exposure control, wherein simultaneously a coupling roller is moved into its driving position. This coupling roller operates the delivery means for sheets of copying material arranged on the stack, particularly where the stack is mounted in the contact pressure cover. By means of this solution, the contact pressure cover may be pivotable about an axis extending parallel to a longitudinal side wall, i.e. an axis extending parallel to the forward direction of the materials. In view of an exposure plate arranged in recessed position under the upper housing wall, this arrangement provides a continuous and smooth design of the apparatus, even with the cover closed, which is important for protecting the apparatus against dust and the like. More particularly, however, the original may be inserted from the front. The coupling roller is associated with a continuously revolving pair of rollers in the housing adjacent to the cover, and on one side wall of the apparatus, and may act simultaneously on a roller of the pair of rollers and on a delivery roller on the stack.

By way of example, transport means may be provided acting on the store of the transfer and/or receiving materials in such a manner that they may be disconnected by means of a limit stop on the cover when the contact pressure cover is open, wherein the cutting mechanism and the transport device, effective in the ready position, are drivingly interconnected and adapted to be released by a stop when the cover is closed. Furthermore,

a locking lever for starting the transport for at least the transfer material may be released by a switch which is actuated by the original or by the contact pressure cover.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be further described, by way of example, with reference to embodiments shown in the accompanying drawings, in which:

FIG. 1 is a diagrammatical side elevation of a first embodiment of an apparatus according to the invention;

FIG. 2 is a view similar to FIG. 1 but showing another embodiment of the invention;

FIG. 3 is a partial view of a further embodiment of the invention similar to that in FIG. 2;

FIG. 4 is a diagrammatical side elevation in cross-section of yet another embodiment of the invention;

FIG. 5 is a diagrammatical flow and function diagram, explanatory of the invention;

FIG. 6 is a diagrammatical partial side elevation explaining a coupling between a cover for the exposure section and a drive release mechanism;

FIG. 7 is a partial side elevation of FIG. 6, viewed from the left-hand side;

FIG. 8 is a cross-section along the line VIII—VIII in FIG. 6, showing diagrammatically also the construction of the apparatus;

FIG. 9 is a partial view of FIG. 4, viewed in the plane IX in FIG. 4, but showing only the essential components;

FIGS. 10 and 11 shows different embodiments for releasing the transport device in the embodiment of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. 1 shows a basic embodiment of the invention. In this embodiment, the apparatus comprises a housing 1 in which is mounted a reflector 2 with parabolic cross-section, the upper edge of which terminates on a transparent exposure plate 3. In this reflector, there is an exposure light source 4 which, with uniform transverse dimension of the apparatus, may be a fluorescent lamp and above which a shutter 5 prevents direct irradiation of the center region of the exposure plate 3. The exposure device is covered towards the top by a cover 6, adapted to pivot through hinges 7, 7' and an axis extending parallel to the plane of FIG. 1. On the right-hand side of the unit comprising the exposure device of FIG. 1, the housing 1 contains two transport devices 8, 9 which are interconnected by a drive means 10, e.g. a cable drive or alternatively a gearing, a belt or the like.

As disclosed in U.S. Pat. No. 3,552,849, the transport devices 8, 9 comprise a roller 11 with a flat portion and a continuously revolving roller 12 connected to the main drive of the apparatus. As shown in FIG. 5, the flattened roller 11 is connected to a spring 13 which tends to rotate the flattened roller 11, when the flattened portion of the roller 11 faces the roller 12, in such a manner that the circular part of its periphery engages guidingly with the circumference of the roller 12. The spring 13 acts eccentrically on the roller 11 and is mounted with its other end at 110 on a wall of the housing, as shown in detail in FIG. 8. In the position in which the flattened part of the roller 11 faces the roller 12, the flattened roller 11 is held by a locking lever 14 which engages by means of a lug 15 into a recess 16, provided on a lateral projection of the flattened roller 11. The locking lever 14 is mounted pivotably about a pivot 17 in the housing 1. A spring 21 acts on the locking lever 14 in order to pull the lug 15 into the recess 16. Between the lug 15 and the pivot 17 of the locking lever 14, there is a tongue 18 with a roller acting as cam follower and co-acting with a cam disc 19 having a circumferential recess 20. The cam disc 19 is connected by a toothing 23 with a drive pinion 22 on the roller 11 with the flattened portion, a transmission being provided so that the cam disc 19 rotates, for example, once for every three to six revolutions of the flattened roller 11. The cam disc prevents the intermediate stopping of the flattened roller 11 by retaining the locking lever 14 in the disengaged position, and the spring 21 causing the flattened roller to overrun beyond the section with the recess 16 into renewed engagement with the continuously revolving roller.

This type of control, and more particularly its arrangement within the apparatus, will be explained in greater detail with reference to FIGS. 5 to 8.

Preferably, a spring abutment is mounted in front of the transport means for operating the drive for the receiving and transfer materials, and collaborating with an abutment in the opened cover, wherein the locking device can be released only after the spring abutment has been overcome. The spring abutment is connected in front of or behind the operating end of the locking lever in such a manner that the locking lever can be moved sufficiently only after compression or by compressing the spring abutment. This is only one possible solution, and FIG. 5 shows another construction in which the cover is adapted to operate a lifting magnet.

FIGS. 6 and 7 show a further solution for operating the cover. During the release of the transport mechanism by the movement of the cover described above, in which the locking lever 14 is withdrawn from the recess 16 by means of an abutment, the drive means 10 serves also for operating a drive 9 formed by a flattened roller 24 and a continuously revolving roller 25. The adjacent end face of the housing 1 contains storage devices, in this instance storage reels 26, 27, within a housing 28, which may have the form of an attachment, wherein the leading ends of the materials, i.e. the transfer material from the reel 26 and the receiving material from the reel 27, pass through driving arrangements 8 and 9. The reels are mounted on levers projecting on both sides, the forward levers being shown at 29, 30. For the reel axles, these levers have upwardly open bearing shells 111, 112.

The ends of the band-shaped copying materials run, with particular regard to the transfer material, from the reel 26 through the transport device 8, and over the exposure plate 3, through a guillotine 31, along a guide element 32, and to a further transport mechanism 33 with a flattened roller 34 and a continuously revolving roller 35. The guide element 32 has a break 36, receiving a guide channel 37 with guide elements leading to a pair of delivery rollers 38 underneath which there is a collecting trough 39. In the zone of the break 36, the guide channel 37 has also a break 113. Thus, two intersecting guide surfaces or guide channel arrangements 32, 37 are provided which are open at the intersection. The guillotine 31 may consist, for example, of a fixed blade 115 and a movable blade 114. A carrier for the

movable blade may have a stop 116 mounted in the path of an abutment 117 on the cover 6, so that the stop is operated against the action of a spring when the abutment acts on the stop. Such a spring is shown by way of example at 118. Its upper end rests on a plate-shaped abutment on a connecting link 44 for the two movable blades 114, 120, and its other end on an abutment arranged in the form of a ring in the housing. This is a comparatively simple construction of a cutter in which a particular operation may be achieved in that the lifting of the cover 6, overcoming a spring abutment, produces an advance of the copying materials from the storage reels 26, 27, wherein after closing the cover the previously exposed parts are cut off and supplied to the developing device 40. This produces a substantial simplification. In this connection, it should be mentioned that the guide element 32 has a corresponding guide element 41 with suitable geometrical configuration relative to the developing device.

The guillotine 31 may also have a special construction. According to FIG. 1 it consists of an upper cutting mechanism 42 and a lower cutting mechanism 43 which are interconnected by links 44. As shown in FIG. 2, only the upper cutting mechanism 42' has to be provided. The movable blade of the lower cutting mechanism 43 is shown in FIG. 1 at 120. If there is no lower cutting mechanism 43, the movable blade of the upper cutting mechanism 42' may have a linkage with the spring 118. It should also be noted that the length of the guide elements 32 and 41, respectively, is such that copying materials guided thereover, possibly after the cutting, enter together the developing section or the transport mechanism 33 upstream thereof. According to FIG. 1, this transport mechanism 33 comprises a continuously revolving roller 35 and a flattened roller 34 affected both by an eccentrically mounted spring 122 (FIG. 10) and a locking pawl 123. This pawl is connected with an operating magnet 124 which is released briefly against the action of the spring 125 when the exposure light source 4 is switched on. This may be achieved by a switch 126 which is connected by a transmission link 127 with an intermediate switch 128 in such a way that the switch 128 closes only briefly during the closure of the switch 126.

It is also possible to switch the exposure light source 4 as a function of the closure of the cover 6. In this case, the abutment 117 may also be used for operating the switch 126 in the closing direction, but the exposure light source 4 would have to be associated with a timing clock, so that an exposure takes place only for an adjustable period, and not for a random period, such as closure of the cover. Such a timing clock 129 is shown in the partial view of FIG. 11. It may be seen that this clock is connected to the power source 130 in front of the switch 126.

FIG. 2 shows an apparatus modified with regard to FIG. 1, and in which similar parts are shown under the same reference numerals plus the prime-symbol. Here, the storage device for the receiving material is a stack of sheets 45 with a withdrawing device 46 from which the foliate material passes over a guide 47, corresponding to the guide element 41 in FIG. 1, to a transport mechanism 48 and a downstream developing section 40'. Obviously, as shown in FIG. 3, it is also possible to mount a transport and guide mechanism 50 behind the developing section 40'', whereby the combined materials are delivered from the developing section 40 through a delivery slot 51 in the front face of the housing 1 on which the storage reel 26'' for the transfer material is arranged.

The transport mechanisms 48, 48' correspond substantially to the transport mechanism 33 in FIG. 1, comprising rollers 34, 35 as is also shown in FIG. 10.

The developing section 40 is shown in FIG. 1 schematically as a heating mechanism with a heating drum 131 revolving between three rollers 132 and 134 within belts 135 running about these rollers. The belts may be of rubber, plastic or the like. According to FIG. 3 the developing device may be a heating box with a pair of continuously driven transport rollers 136, 137 downstream thereof.

The withdrawing device 46 shown in FIGS. 2 and 3, and having a driven roller 139 on a swivel arm 138 and resting on the top sheet of the stack 45, has, in front of the stack, a pair of drive rollers 140, 141 driven in contact with each other in the withdrawing direction, and behind which a switch 142 with a moving contact arm 143 is arranged in the path of a sheet of copying paper. This switch is mounted in the roller drive in such a way that its actuation stops the drive. However, the switch 142 is bridged by the control of the apparatus, so that the transport is again switched on when a sheet of copying material has been removed from the ready position. The reactivation is effected in the same way as, e.g., the release of the drive mechanism 48'. Between these, and the transport rollers 140, 141, an operating link 144 is, therefore, provided.

Such withdrawing devices are described in U.S. Pat. No. 3,552,849.

FIG. 4 shows, by way of example, a bearing block 145, mounted on one side and connected to the side wall.

The joints 146, 147 are shown merely diagrammatically. The drive for withdrawing a sheet of copying material will be described further below in conjunction with FIG. 9, which also shows in detail the drive of the delivery roller 59.

On the right-hand side as shown in FIG. 4, there is a storage chamber 60 adapted to receive a storage reel 61 corresponding to the storage reel 26 for the transfer material in FIG. 1. Behind this storage reel and in front of the exposure plate 52, there is a transport mechanism 62, comprising rollers 11', 12' and corresponding to the transport mechanism 8 in FIG. 1. These rollers, of which the roller 11' has a flat section, are controlled by the cover as described hereinbefore. The chamber 60 is accessible through a detachable cover 63.

On the left side of FIG. 4 there is a chamber 64 in which a continuously revolving pair of transport rollers 65, 66 is mounted immediately at the point of entry of a sheet of receiving material from the stack 54. Downstream of this pair of transport rollers is a channel 67 formed by guides and extending arcuately downwardly to a transport mechanism 68 at the inlet of a developing section 69. The transport mechanism 68 corresponds in arrangement and construction to the transport mechanism 33 of FIG. 1. It may be seen that it comprises a continuously revolving roller 70 and a flattened roller 71, having a one-sided circumferential flange 72. As already described, this flange has a locking recess 73 into which engages a locking lug 74, and a mounting 75 for a spring 76 which rotates the roller 71 after release of the locking lug 74, until the uncut section of the roller 71 engages the circumference of the continu-

ously revolving roller **70**, whilst the locking lug **74** causes the roller **70** to stop in a position in which the flattened portion faces the roller **71**. Starting from the left side of the exposure plate **52**, there is a channel **76** of guide elements, connected to the channel **67**. Both channels end in front of the gap of the transport mechanism **68**.

The locking lug **74** is mounted in the part **77** of a two-armed lever pivotable about a pivot **78** and whose other arm **79** extends to an actuating element **80**, for example a push button of an exposure clock **81**. The lever **77**, **79** is therefore, moved to release the drive mechanism **68** when the exposure clock **81** is started.

An exposure light source **83** is mounted under the exposure plate **52** inside a reflector **82**, preferably under a screen **84** for the center part of the exposure plate **52**.

Under the reflector **82**, and passing partially through the bottom of the housing **85**, there is an upwardly concave heating element **86** with an endless belt conveyor **87** running alongside it. This forms the developing section and extends from the transport mechanism **68** under the exposure device to a chamber **88** underneath the chamber **60**, containing the storage reel **61**. At the point **89** in the chamber **88** at which the belt of the conveyor **87** is lifted from the preferably circularly bent heating element **86**, a laminate of receiving material and transfer material is delivered and drops into a collector **90** extending towards the outside through an opening in the wall **91** of the housing.

Since the transfer material is supplied in the form of a continuous band, it must be cut after transportation from the exposure plate **52** into the channel **76**. To this end, a guillotine is provided consisting of a fixed blade **92** and a movable blade **93**. The fixed blade is located on a partition **94** separating the chamber **64** from the exposure device, whilst the movable blade **93** is mounted on the associated edge of the cover **53**. This provides a particularly simple guillotine which is operated by closing the cover.

The withdrawing of a sheet from the stack **54** is achieved in a particularly favorable manner. A plunger **167** is vertically guided on the partition **94** in vertical guides **95,96**; this plunger is articulately mounted at the bottom on the lever arm **77** and carries on the top on a side adjacent to the stack **54** a coupling roller **98** with its axis parallel to the axes of rollers **59** and **65**. The coupling roller **98** is freely rotatable. When the lever with the arms **77**, **79** is operated against the action of a spring **99**, tending to pull it into its locking position, the coupling roller **98** is simultaneously lifted until it rests on the sides of rollers **59** and **65** adjacent to the stack **54**. In this manner, the rotation of the continuously driven roller **65** is transmitted to the withdrawing roller **59** and the operation lasts for a sufficiently long period to enable a sheet to reach the gap between the rollers **65** and **66**.

In order to simplify the description, it will be assumed that the flattened rollers **11** and **71** have circumferences of sufficient length so that a single revolution performs a sufficiently long transport step. Obviously, it is possible to make provisions for a multiple revolution such as shown in FIG. **5**.

After positioning the materials, with the end of the transport material extending to the end of the exposure plate **52** remote from the storage reel **61**, the cover **53** is opened and an original is positioned on the transfer material, the active layer of which is on the top, in such a manner that the picture to be copied faces in the downward direction. Then the cover is closed and the push button **80** of the exposure clock is depressed. If this actuation releases simultaneously the transport mechanism **68**, the latter will make a first idling step, because no paper is in the ready position. The raising of the coupling roller **98** transports, however, a sheet of receiving material into the ready position.

It should be pointed out at this point that the channel **76** has such a length that a transfer sheet, cut off by the guillotine **92**, **93**, is pushed with its leading end into the gap between the flattened roller **71** and the roller **70**. The receiving sheet, supplied through the slightly longer channel **67** reaches under the action of gravity the same gap, because it rests on the circumference of the continuously revolving roller **70**, whilst this contact under the own weight of the paper is, however, insufficient to carry it along. The ready position may also be defined accurately by means of a withdrawable limit stop.

After exposing the first original, the cover **53** is opened and pushed back so far that the transport mechanism **62** with the rollers **11'**, **12'** is released as described above. This transport mechanism transports the transfer material located on the exposure plate **52** with its leading edge into the gap of the transport mechanism **68**. A new original is placed in position and the cover is closed, causing the blade **93** to cut the transfer material along the edge of the exposure plate. The release of the exposure clock **81** now causes both the process just described and the further transport of the receiving the transfer sheets from the ready position into the developing section **69**. Simultaneously, a new receiving sheet is transported into the ready position.

In the simple construction, the laminate of transfer and receiving sheet passes through the developing section into the collector **90** from where it can be removed.

The circuit diagram shown in FIG. **5** comprises a main connection **92A** for the apparatus, with a main switch **93A** to the connections between which is mounted a main drive motor **94A** and a fan **95A**. In addition, between the main leads **96A** and **97A** there is an exposure light source **99A**, adapted to be switched by a switch **161** and controlled by a time clock **110**.

In addition, a thermostat **101** is mounted between the main leads **96**, **97**, operating a switch **102** for a heater **103** operating in the developing section **40**.

Furthermore, in the circuit of FIG. **5**, an arrangement is shown which comprises a limit stop **104**. Preferably this stop is operated by the cover but may also be released potentially by the original, and energizes, when it is moved into the position **105**, a magnet **106** for moving the locking lever **14**, causing the transfer material to be transported. The energization is brief because the switch with the positions **104**, **105** is connected to a capacitor **107**. In the position **104** the capacitor is charged by a rectifier, whilst in the position **105** it discharges through the magnet **106**, so that the latter lifts the lever **14** briefly by means of an armature **108**, shown in dotted outline.

In FIG. **5**, only a single transport mechanism with rollers **11**, **12** is shown. The other transport mechanisms are released in a like manner, unless they are coupled by different means, as explained further below.

With regard to FIG. **5**, it should be noted that all continuously revolving parts are connected by transmis-

sions 148 to the motor 54. These comprise, for example, the rollers referenced 12, 25, 35, at least one of the rollers 132 through 134, the roller 38, the driving connection 144 to the rollers 139 through 141, the drive rollers for the belt 87, as well as the roller 70 and the pair of transport rollers 65, 66. This connection is only shown diagrammatically.

In the construction of FIG. 5, the release of the transport mechanism 8, comprising the flattened roller 11 and the continuously revolving roller 12 is shown. Since actuation takes place as a function of opening the cover, these parts are shown in FIGS. 6 through 8 partly in connection with the cover, the arrangement corresponding to that of FIG. 5 and corresponding parts being indicated under the same reference numerals. While FIG. 5 shows an operating magnet 106, according to FIGS. 6 and 7 a pivoting lever 149 is adapted to swivel on the cover 6 under actuation of the pins of hinges 7, 7' about an axis 150 which is perpendicular to the hinge axis of the cover 6. This lever 149 is held by a spring 151 elastically in a substantially vertical position. In this position its lower end is guided in a fixed abutment 152 along its initial movement. The abutment has an upper oblique surface 153 which allows a correspondingly sloping foot 154 of the lever 149 to escape after an initial opening movement of the cover.

Prior to the escape, the locking lever 14, which is flexible particularly at its free end, is taken along against the action of the spring 21. In this configuration, the lever 14 has a sloping end 155 matching the slope of the foot 154. The distance between the end and the abutment 152 is sufficient because the downwardly pointed foot 154 may again be guided under elastic deformation of the resilient locking lever 14 under this lever or its end 155, when the cover is closed.

FIG. 8 shows a particular solution in that mounting partitions 158, 159 are located in spaced apart relationship between the outer housing walls 156, 157 and the functional components, e.g. in the zone of the developing or exposure sections, are located between these partitions. This is indicated by the rollers 11, 12 which are mounted in the partitions 158, 159. The continuously revolving roller 12 may have a drive wheel, for example a gear 160 in the chamber between the side wall 157 and the partition 159, whereby it is connected to the main drive motor.

In the other chamber between the side wall 156 and the assembly wall 158, the shaft of the roller carries pinion 22 on which spring 13 is fixed by means of an eccentrically projecting arm 170. In a similar manner, the locking lever 14 and the cam disc 19 are also mounted on the assembly wall 158.

FIG. 9 shows a detail of the construction of the apparatus according to FIG. 4. The coupling roller 98 has a pivot 162 which is mounted freely rotatably in a bearing 163. The pivot 162 passes through a slot 164 in a lateral partition, for example in the partition 158 on which the bearing 163 is vertically movable in fixtures 165, 166. The bearing 163 carries a linkage 97 which is movable in the fixtures 165, 166 in such a way that the driving connection between the rollers 59, 65, may be made as described above. Of these two rollers, roller 65 is driven.

I claim:

1. A copying apparatus using as copying material transfer material and a receiving material in the contact method with at least one of the transfer material and receiving material supplied as a continuous strip, comprising a housing, an exposure device including an exposure plate positioned in a center region of said housing, means for moving the copying material through said housing including moving at least the transfer material past said exposure plate and then moving it downstream from said exposure plate, hinge means mounted on said housing and the axis of said hinge means disposed in parallel relationship with the direction of movement of transfer material material across said exposure plate, a cover pivotally mounted on said hinge means and positionable between a closed position covering said exposure plate and an open position displaced from said exposure plate, a developing section positioned within said housing and arranged downstream of said exposure plate in the path of the copying material passing through said housing, storage means associated with said housing for supplying copying materials within said housing and said storage means for the transfer material located upstream from said exposure plate in the direction of movement of the transfer materials across said exposure plate, said means for moving the copying material including a first transport means located within said housing and arranged in cooperation with said storage means for withdrawing transfer material and receiving materials from said storage means and arranged to be actuated by the operation of said cover when it is moved to its open position so that said first transport means effect transportation of the copying material over a certain length, and actuating means operatively associated between said cover and said first transport means, wherein the improvement comprises that said means for moving the copying material also includes second transport means located between said exposure plate and said developing section, a release mechanism associated with said exposure device operable in response to the completion of the exposure by said exposure device, linking means interconnecting said second transport means and said release mechanism for actuating said second transport means as a function of the completion of the exposure, locking means operatively associated between said cover and said second transport means for releasing said second transport means only when said cover is closed, said locking means also operatively associated with said first transport means so that when said cover is opened transfer material can be supplied to said exposure plate and partially exposed copying materials can be removed through said developing section, and a first cutting device located at the downstream edge of said exposure plate in the direction of movement of transfer material thereover for cutting exposed transfer material for its movement into said developing section while during the transport to said developing section another length of transfer material is exposed.

2. A copying apparatus as set forth in claim 1, wherein said storage means for supplying copying material comprises a reel for storing the transfer material in band form for passage over said exposure plate, and a reel for storing the receiving material in band form, and means for guiding the receiving material from said reel located under said exposure device and including a second cutting device in the path of the receiving material and said second cutting device is connected to said first cutting device and is located below said first cutting device at the downstream end of said exposure

plate, and said first transport means are located downstream of said reels for the transfer material and receiving material and said first transport means including a drive means.

3. Copying material as set forth in claim 1, wherein said storage means for supplying copying material includes a reel for storing the transfer material in band form for passage over said exposure plate, said first transport means for the transfer material is arranged between said reel and said exposure plate and is located upstream from the end of said exposure plate at which said first cutting device is mounted, a stack located within said housing for storing the receiving material, and said first transport means for the receiving material is provided between said stack and said second transport means mounted upstream of said developing section.

4. A copying apparatus as set forth in claim 3, wherein the stack for the receiving material is arranged in the cover and a dispensing roller is mounted above the topmost sheet of the stack, a spring is arranged in the cover urging the topmost sheet of the stack against the dispensing roller, a driven pair of transport rollers is mounted in the housing adjacent to the end of the cover from which the paper is delivered, and a coupling roller is vertically movable in the housing and is adapted to co-operated with the dispensing roller and a driven roller of the said pair of transport rollers in such a way that it engages in the raised position both rollers, bearing means of said coupling roller being connected with the said linking means for the exposure device and the said second transport means in such a manner that the coupling roller engages with closed cover and released exposure device in order to transport a sheet of receiving material into a ready position in front of the exposure device.

5. A copying apparatus as set forth in claim 3, in which said stack for the receiving material is arranged under the exposure device.

6. A copying apparatus as set forth in claim 5, wherein a guide element is provided downstream of the exposure plate in the direction of movement of the transfer material and leading to the said second transport means upstream of the developing section along a curve, and a second guide element is provided between the stack of receiving material and the said second transport means and the first and second guide elements have the same length for combining the copying materials on the developing section.

7. A copying apparatus as set forth in claim 6, comprising a pair of delivery rollers adjacent to a delivery orifice of the housing, a guide channel arranged at the outlet of the developing section, leading to the pair of delivery rollers, said outlet channel passes through the first guide element, the first guide element has a first break at the point of the intersection, and the guide channel has a second break at the point of the intersection.

8. A copying apparatus as set forth in claim 6, wherein a delivery channel is provided between the developing section and an outlet orifice from the housing located under the exposure device and above the stack of receiving material sheets.

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