(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 034 472**
A1

(12) EUROPEAN PATENT APPLICATION

(21) Application number: 81300581.6

(22) Date of filing: 12.02.81

(51) Int. Cl.³: B 41 J 33/00

(30) Priority: 15.02.80 IT 6722780

(43) Date of publication of application:
26.08.81 Bulletin 81/34

(84) Designated Contracting States:
CH DE FR GB LI

(71) Applicant: Ing. C. Olivetti & C., S.p.a.
Via G. Jervis 77
10015 Ivrea(IT)

(72) Inventor: Camosso, Mario
Via Castellamonte 3A
I-10010 Banchette (Turin)(IT)

(74) Representative: Pears, David Ashley et al,
REDDIE & GROSE 16 Theobalds Road
London WC1X 8PL(GB)

(54) Typewriter with correcting device.

(57) A typewriter of the hammer type has an ink ribbon (25) contained in a cartridge located to the side of the hammers. The depression of each typing key causes the cartridge to swivel so that its lateral appendix (29) raises the ribbon at the typing point (0). A second cartridge (26) containing a correcting ribbon (27) is normally kept away from the typing position. The depression of a correcting key controls a correcting mechanism which locks the cartridge containing the ink ribbon, and swings the cartridge containing the correcting ribbon up and towards the centre so as to position the active part of the correcting ribbon above the typing point (0). When the key of the character to be erased is then depressed to strike the hammer, the ink ribbon cartridge stays locked while the cyclic hammer actuating mechanism also hilts the correcting cartridge to lower the active part of the ribbon (27) to the typing point (0).

EP 0 034 472 A1

./...

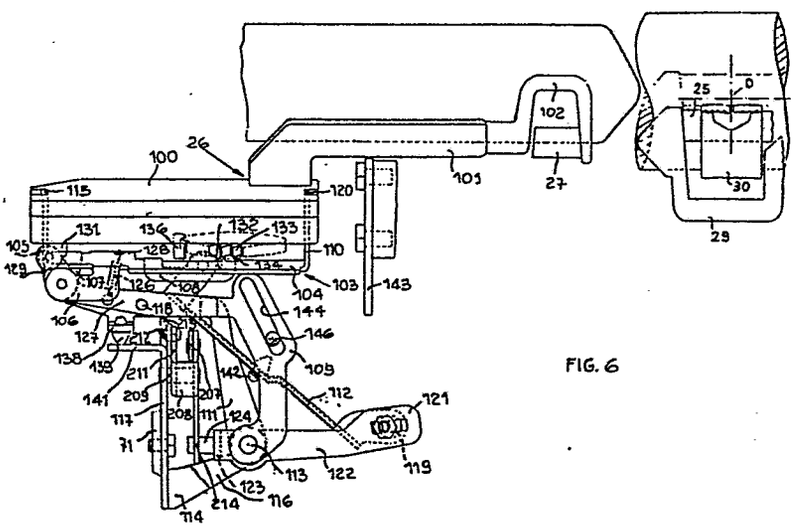

100
26
115
120
101
102
27
25
0
30
29
131
136
132
133
110
105
129
107
126
108
103
104
143
106
118
144
127
146
138
139
211
142
109
141
205
207
112
121
117
208
111
124
71
113
122
119
123
214
116
114

FIG. 6

TYPEWRITER WITH CORRECTING DEVICE

This invention relates to a hammer typewriter as set out in the introductory part of claim 1.

In a hammer typewriter, in order to attain proper alignment of the typed characters, a guide fork for the striking hammers is provided at a very short distance from the striking point, but with sufficient clearance for the passage of the typing ribbon. When the ribbon is carried by a cartridge, it is guided to the striking point by a lateral arm of the cartridge. The residual space between the fork and platen is even more limited, and is not sufficient to allow the use of correcting devices which utilise a correcting ribbon together with the typing ribbon.

The object of the present invention is to provide a hammer typewriter which can use a typing ribbon cartridge and which is provided with a correcting device which is simple, of low cost, practical and functional. In accordance with this object, the typewriter according to the invention is characterised as set out in the characterising part of claim 1.

The invention will be described in more detail, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a partly sectional diagrammatic plan view of a typewriter embodying the invention;

Figure 2 is a partly sectional enlarged plan view of some details of the typewriter of Figure 1;

Figure 3 is an enlarged part of Figure 2;

Figure 4 is a partly sectional enlarged front view of a first detail of the typewriter of Figure 1;

Figure 5 is a partly sectional right hand side view of the detail of Figure 4;

Figure 6 is a partly sectional enlarged front view of a second detail of the typewriter of Figure 1;

Figure 7 is a front view of the detail of Figure 6 in a first working position;

Figure 8 is a partly sectional right hand side view of the detail of Figure 6;

Figure 9 is a partly sectional right hand side view of the detail of Figure 6 in the first working position;

Figure 10 is a partly sectional right hand side view of part of the detail of Figure 6;

Figure 11 is a partly sectional right hand side view of a third detail of the typewriter of Figure 1;

Figure 12 is a part of Figure 11 in a working position; and

Figure 12 is a further part of Figure 11 in a working position.

With reference to Figure 1, a typewriter 20 embodying the invention comprises a keyboard 21, a group of typing hammers 22, a platen 23 mounted on a carriage 35, a cartridge 24 containing a typing ribbon 25 and a cartridge 26 containing a correction ribbon 27.

INK RIBBON FEED MECHANISM

The cartridge 24 (Figures 4 and 5) comprises a container 28 for the typing ribbon 25, which can be either of the carbon type or the endless ink type arranged in bulk in the container 28 in any known manner. A lateral projection 29 on the cartridge 24 is shaped so as to keep the ribbon 25, which emerges from the container 28, positioned between the platen 23 and a guide fork 30 for the hammers 22. The cartridge 24 is removably mounted on a support 31, which comprises a substantially horizontal plate 32 and two lateral arms 33 and 34, by means of which the support 31 is pivoted on two pins 36 and 37 carried by two lugs 38, 39 respectively of a frame 41, fixed to a right side 42 of the machine 20.

A spring 43, stretched between the frame 41 and an end 44 of the arm 33, tends to cause the support 31 to rotate clockwise about its pins 36 and 37.

A lug 46 of the support 31 carries a cylindrical peg 47, which is housed in a slot 48 of a lever 49 pivoted on a pin 51 fixed to the right side 42.

A lower end 52 of the lever 49 is kept by a spring 56 continuously in contact with a three lobe cam 53, which is keyed on to a main shaft 54 of the typewriter 20. In any known manner, for example as described in our Italian patent No 688,151, the

shaft 54 makes one third of a turn each time a typing key of the keyboard 21 is depressed.

A second three lobe cam 57 is keyed on to the shaft 54, and with it there cooperates a cam follower 58 carried by a lever 59 which is pivoted in its turn on a pin 61 fixed to the right side 42. A spring 62 keeps the cam follower 58 constantly against the cam 57.

A connecting rod 63 has an end 64 connected to the lever 59 and an end 66 connected to the lower end 67 of a lever 68, which is pivoted on a shaft 69 fixed to the right side 42 and to a left side 71 (Figures 2 and 3) of the typewriter 20.

An upper end 72 (Figure 9) of the lever 68 is connected by a rod 73 to an arm 76 (Figure 4) of a lever 77 pivoted on a vertical pin 78 of the frame 41. The lever 77 has one arm 79 connected to one end 81 of a pawl 82 which comprises a tooth 83 cooperating with the teeth of a sawtooth wheel 84. The wheel 84 has a shaft 85, mounted rotatable on the plate 32, and having an upper end 80 housed in the cartridge 24 in order to effect the unidirectional feed of the typing ribbon 25 in any known manner. A reverse direction pawl 86 engaged with the wheel 84, is pivoted on a pin 87 of the plate 32 and is pulled by a spring 88.

When in the rest state, the cartridge 24 (Figure 4) is substantially horizontal, and the ink ribbon 25 disposed between the fork 30 and roller 23 is in a lower position than the striking point O (Figure 6). When any typing key of the keyboard 21 (Figure 1) is depressed, the shaft 54 (Figure 5) is rotated through 120° in the known manner described in the said Italian patent No 688,151. Consequently, the cam 53 causes the lever 49 to rotate clockwise against the action of the spring 56, until the lever 49 reaches the position shown by dashed lines in Figure 5. In this position, because of the action of the spring 43 (Figure 4), the support 31 and carriage 24 rotate clockwise and the projection 29 rises until the ink ribbon 25 becomes positioned on the typing line in the position shown by dashed lines in Figure 6, before the hammer 22 corresponding to the depressed key prints a character. Simultaneously, the cam 57 (Figure 5), rotating through 120°, also causes the lever 59 to rotate anticlockwise against the action of the spring 62, and the lever 68 to rotate anticlockwise

by means of the connecting rod 63. By moving into the position shown by dashed lines in the figure, the lever 68 causes the lever 77 to rotate by way of the tie rod 73, and the lever 77 causes the toothed wheel 84 to rotate by means of the pawl 82, and thus the ink ribbon 25 to advance inside the container 28 (Figures 4 and 5). When the shaft 54 has completed its 120° rotation, the mechanism returns to the rest position by the action of the spring 56.

CORRECTING DEVICE

The cartridge 26 (Figures 6, 7 and 8) comprises a container 100 in which the correcting ribbon 27 is arranged in any known manner, for example wound on spools. The ribbon 27, of known type, can be either of the lift-off type or of the cover-up type, and is carried by an upper protuberance 101 projecting upwards and sideways from the container 100 of the cartridge 26. The end of the protuberance is shaped to comprise a fork 102 arranged to guide a portion of the ribbon 27 in such a manner that it can be located between the platen 23 and fork 30, as described hereinafter.

The cartridge 26 is removably mounted on a support 103, which comprises a substantially horizontal plate 104, two upper lugs 105 and 110 on which the container 100 rests, and two side tabs 115 and 120 for locking the cartridge 27 on the support 103. The plate 104 is also provided with three lower lugs 106, 107 and 108, to which three levers 109, 111 and 112 are respectively connected.

The two levers 109 and 111 are substantially parallel to each other and are pivoted on a pin 113 which is supported by two lugs 114, 116 of a frame 117, fixed to the left side 71 of the typewriter 20. A bar 118 rigidly connects the two levers 109 and 111 together in the form of a bridge.

The lever 112 is disposed between the two levers 109 and 111, and is pivoted on a pin 119 parallel to the pin 113. The pin 119 is mounted at an end 121 of a lever 122, bridge-pivoted on the pin 113 and provided with a lug 123 to which a peg 124 is fixed.

The assembly comprising the lever 109, 111, the lever 122 the lever 112 and the support 104 form an articulated parallelogram. A spring 126 is stretched between an arm 127 of the lever 109 and a bent portion 128 of a plate 104 which, when at rest, keeps the articulated parallelogram closed with the support 104 in its lower position. The lever 111 has a bent position 138 on which there is fixed a rubber stop 139 which, when at rest, bears on a horizontal lug 141 of the frame 117.

To an upper end 129 of the lever 109 there is fixed a pawl 131 comprising a tooth 132 cooperating with the teeth of a sawtooth wheel 133, which has a shaft 134 mounted rotatably on the plate 104 and with an upper end 135 housed in the cartridge 26, in order to effect the feed of the correcting ribbon 27 in any known manner. A reverse direction pawl 136 is kept normally engaged between the teeth of the wheel 133 by a spring 137.

When in the working position, the articulated parallelogram is in its most open configuration, and the support is in a raised position. A rubber stop 142, carried by the central lever 112, is then arrested against a fixed plate 143 (Figure 7). The movements of the support 104 are controlled by the lever 109, which is provided with a slot 144 (Figures 6, 7 and 8) in which there is housed a peg 146 mounted at an end 147 of a bridge lever 148 (Figures 2, 3, 8 and 9).

The bridge lever 148 is pivoted on a vertical pin 149 rotatably mounted on a bent portion 151 of the left side 71, and is shaped to comprise four arms 152, 153, 154 and 156, of which the first three are coplanar while the fourth is disposed at a lower level.

The arm 153 of the lever 148 carries a lower lug 157, with which a tooth 158 of a lever 159 is arranged to cooperate. The lever 159 is shaped to comprise a slot 161, in which is inserted a pin 162 of a lever 163 disposed to the side of the lever 159. The two levers 159 and 163 are connected together by a spring 164 which tends to rotate the lever 159 clockwise (Figure 8) relative to the lever 159, about the pin 162.

The lever 159 is also provided with a lug 166 which, when in the rest position, is housed in a groove 167 of a lever 168

pivoted on the shaft 69 and bridge-connected by a cross member 169 to a lever 92 (Figure 11) which is pulled by a spring 90 and is provided with a tooth 91 arranged to cooperate with a lower hook 89 of the support 31 (Figure 5) of the cartridge 26 containing the typing ribbon. The lever 168 (Figure 8) comprises a lower tooth 170 which is arranged to halt against the fixed bent portion 15. A contour 171 of the lever 159 normally rests against a peg 172 carried by the lever 163.

The lever 163 is supported by two further levers 173 and 174 pivoted on pins 176, 177 respectively, which are fixed to the left side 71. On the bent portion 178 of the lever 174 there is pivoted a cam following roller 179, which is normally held against the contour of a cam 181 by a spring 182.

The cam 181 is mounted on a shaft 183, which is rotatable on the fixed sides 42 and 71 and on which there is keyed a service clutch 184 which can be actuated by a control lever 186 in order to rotate the cam 181 through 360°, and is connected to the typewriter back-space mechanism, which is not described herein for brevity. By way of example, this mechanism can be of the type described in our British patent specification 1,575,326.

With the arm 153 of the lever 148 there cooperates a lever 180, which is pivoted on a pin 185 fixed to the left side 71 and is pulled constantly downwards by a spring 190. The lever 180 is shaped to comprise a lower part 195 which normally rests on the arm 153, and a tooth 200 arranged to cooperate with the lug 157 of the arm 153 when in the working position. The arm 154 of the lever 148 is shaped to comprise a substantially circular edge 187 concentric to the pin 149, and a straight edge 188 which, when in the rest position, is close to an upper lug 189 of the cross member 169.

The lower arm 156 of the lever 148 is provided with a slot 191 in which a pin 192 of a lever 193 is inserted. The lever 193 is pivoted on a pin 194, which is mounted on the arm 176 of a slider 197. The slider 197 is bridge-shaped, can rotate and slide axially relative to the shaft 69, and has a side wall 198 provided with a lug 199. A spring 201 is stretched between the wall 198 and the lever 193. When in the working position, the lug 129 is arranged to cooperate with a lever 202 (Figures 8 and 10) pivoted on the shaft 69 and having a lower end 203 connected by

means of a bar 204 to the lever 68.

An upper end 206 of the wall 198 of the slider 197 is connected to a connecting rod 207 which has its other end connected to a bridge lever 208 (Figures 6, 7 and 10). The lever 208 is pivoted on a pin 209 of the frame 117, and has an upper appendix 211 hooked by a spring 212 to a lug 213 of the frame 117, and a lower arm 214 provided with a slot 216 in which the peg 124 of the lever 122 is inserted.

The lever 207 is provided with a fork 217 in which there is housed a peg 218 of a lever 219, which is pivoted on a pin 221 fixed to the left side 71, and has a lug 222 arranged to cooperate with the lug 157 of the lever 148 when in the working position.

A correcting key 223 (Figure 1) of the keyboard 21 is connected in any known manner to a lever 224 (Figures 2 and 11), which has a fulcrum 226 pivoted on a cross member 227 of the typewriter 20. The lever 224 has an end 228 arranged to cooperate with a fixed stop 229 and a tooth 231 hooked to a lug 232 of a lever 233 which is pivoted on a fixed pin 234.

The lever 233 is provided with a blade 236 cooperating with a lever 237, which is connected to the lever 186 in a conventional mamner not shown on the drawings, in order to cause the cartridge 35 to back-space in any known manner, for example in the manner described in the said GB-PS 1 575 326. A lever 238 controllable by a conventional back-space key 239 (Figure 1) of the keyboard 21 also cooperates with the lever 237. By means of a non-repeat element, the lever 233 is arranged to preselect the raising of the cartridge comprising the correcting ribbon, this then being carried out during the back-spacing of the carriage 35, and is also arranged to block the raising of the cartridge comprising the typing ribbon and to set the temporary locking of the typewriter escapement in order to prevent spacing of the cartridge during the correction cycle. In particular, the non-repeat element is constituted by a lever 243 (Figure 11) fitted with a peg 242 housed in a slot 241 provided in the lower part of the lever 233. A spring 244 tends to rotate the lever 233 in a clockwise direction, and a spring 246 is stretched between the lever 233 and an end 247 of the lever 243.

The lever 243 is also provided with an arm 248 comprising a tooth 249, and with an arm 251. The tooth 249 cooperates with the lateral edge 252 of a release lever 253, and the arm 251 is arranged to cooperate with a lug 254 of a preselection and blocking lever 256. The lever 253 has a tooth 257 normally in contact with the lug 254. A spring 258 tends to rotate the lever 253 clockwise about its fixed pin 259. The lever 256 is pivoted on a pin 261 fixed to the right side 42, and tends constantly to rotate in an anticlockwise direction, pulled by a spring 262 but retained at rest by the tooth 257 of the lever 253.

In order to preselect the cartridge 26 (Figure 1) containing the correcting ribbon and lock the cartridge 24 containing the typing ribbon, the lever 256 (Figure 11) comprises a peg 263 inserted n a slot 264 of a connecting rod 266, the upper end of which is connected by a pin 267 to the lever 92 (Figures 2 and 11). In order to block an escapement cycle of the carriage 35 (Figure 1), the lever 256 is provided with a peg 268 housed in a fork 269 of a lever 271, and with a front tooth 279. The lever 271 is pivoted on a fixed pin 272, and is shaped to comprise a lower blade 273 provided with a slot 274, an end 276 on which a peg 277 is fixed, and a lower tooth 278.

The peg 277 of the lever 271 is normally in contact with an edge 281 of a lever 282, which is pivoted on a pin 283 carried by a lever 284, rotatable in its turn on a shaft 286, the rotation of which causes an escapement tooth 321 to be retracted, by means of a lever 320, from a rack 322 in order to be able to advance the carriage 35 in any known manner, for example as described in our Italian patent No 793,634. A spring 287 is stretched between the lever 282 and the lever 284. The lever 282 is shaped below to comprise an end 288 partially housed in the slot 274 and provided with a hook 289 arranged to cooperate with the tooth 278 of the lever 271.

The tooth 279 of the lever 256 is arranged to cooperate with a peg 291 of a dead key frame 292 which is pivoted on a pin 293 supported by a lug 294 of the right side 42. The frame 292 is mounted in certain TEKNE typewriter models of Messrs Ing. C Olivetti & C, S.p.A., and is operated by the linkages of the so-called "dead" characters for which the advancement of the

carriage 35 is blocked. The frame 292 is in particular connected by a connecting rod 296 to a hook 297 arranged to cooperate with a tooth 298 of a lever 299 keyed on to the shaft 286. A spring 301 is stretched between the lever 299 and lever 284, which is provided with a lug 302 which cooperates with a tooth 303 of the lever 29. The lug 302 is normally in contact with an end 304 of the lever 59.

A lever 306 (Figure 9) has a fulcrum 307 pivoted on a fixed cross member 308, and is connected in any known manner to a space bar 309 (Figure 1) of the keyboard 21. A blade 311 (Figure 9), arranged to cooperate with the lever 180, is located at the end of the lever 306.

When in the rest state, the cartridge 26 allows unobstructed vision of the typing line passing through the typing point O, as it is displaced towards the left to the side of the hammers 22, with the fork 102 distant from the guide element 30 and with the protuberance 101 and ribbon 27 below the cover plate of the typewriter and below the typing line passing through the point O so as not to obstruct vision of the line.

It will now be assumed that an already typed character is to be erased. On depressing the correcting key 223 (Figure 1), the lever 224 (Figure 11) is rotated in an anticlockwise direction about its pivot 226. The tooth 231 of the lever 224 is raised and causes anticlockwise rotation of the lever 233, which by means of its blade 236 causes the lever 237 to rotate clockwise to initiate a back-space cycle of the carriage 35 (Figure 1). After a short rotation, the lever 233 (Figure 12) brings the left side of its slot 241 into contact with the peg 242, so stretching the spring 246. The lever 233, continuing to rotate, causes the lever 243 to move towards the right, and the tooth 249 of this latter causes the release lever 253 to rotate anticlockwise against the action of the spring 258, until its tooth 257 releases the lug 254 of the lever 256, which rotates in an anticlockwise direction pulled by the spring 262. In addition, under the action of the lug 254 on the arm 251, the tooth 249 of the arm 248 is moved below the lever 253, which stops against the lug 254, which is no longer controlled by the key 224. The key 224 can thus be held down in order to repeat the back-space cycle and in order to allow a correction cycle without

there being any effect on the lever 256.

The rotation of the lever 256 causes the connecting rod 266 (Figure 11) to lower, and thus the lever 92 to rotate anticlockwise against the action of the spring 90. In this manner, the tooth 91 cooperates with the lower hook 89 of the support 31, to thus prevent the cartridge 24 (Figure 5) from rising when a typing key is depressed.

The lowering of the connecting rod 266 (Figure 11) has already causes the lever 168 (Figures 8 and 9) to rotate in an anticlockwise direction on the shaft 69 until its tooth 170 stopped against the fixed bent portion 151. As the lug 166 of the lever 159 is released from the groove 167, the lever 159 is able to rotate clockwise pulled by the spring 164, and to dispose its tooth 158 in front of the arm 153 of the lever 148 (Figure 3). Simultaneously, the upper lug 189 of the cross member 169 (Figure 9) withdraws from the arm 154 of the lever 148.

By means of the lever 186 (Figure 8), the rotation of the lever 237 (Figure 11) has released the clutch 184 (Figure 8), and has rotated the service shaft 183 through a cycle of 360°. While the back-space mechanism initiates the return of the carriage 38 through one space in known manner, the rotation of the shaft 183 causes the lever 163 (Figure 9) and the lever 159 connected thereto to move towards the right, by means of the cam 181. The tooth 158 then acts positively on the arm 153, causing the lever 148 (Figure 3) to rotate clockwise and reach the position shown on the figure in dashed lines. Shortly before the lever 148 reaches this position, the arm 153 releases the part 195 of the lever 180, which rotates clockwise pulled by the spring 190, and brings it tooth 200 in front of the lugs 157 (Figure 9) of the arm 153, so preventing any possibility of an immediate return of the lever 147 to the rest position.

By means of its peg 146, the rotation of the lever 148 causes the levers 109, 111 and 112 (Figure 6) to rotate clockwise, and the support 104 to rise until reaching the position shown in Figure 7, with the rubber stop 142 halted against the vertical plate 143. In this position, the articulated parallelogram formed by the three levers 109, 111 and 112, and by the support 104 is in its most open configuration, the support 104 being still substan-

tially horizontal, while the fork 102 is above the fork 30, with the correcting ribbon 27 slightly raised above the striking point O on the roller 23.

In rotating clockwise relative to the support 104, the lever 109 has moved the lever 131 towards the right, and the pawl 132 has caused the toothed wheel 133 to make an incremental rotation, with a consequent advancement of the correcting ribbon 27 inside the container 100 in known manner.

In rotating in an anticlockwise direction about its pin 261, the lever 256 (Figure 13), by way of its lower tooth 279, has made contact with the peg 291 and has thus causes the arm 294 to rotate clockwise. The connecting rod 296 is thus pulled downwards, and the hook 297 becomes disposed in front of the tooth 298 of the lever 299, which, being keyed on the shaft 286 (Figure 11), causes it to rotate. In addition, in rotating in an anticlockwise direction, the lever 256, by means of its peg 268, has also caused the lever 271 to rotate clockwise about the pin 272. In its turn, the peg 277 has caused the lever 282 to rotate in an anticlockwise direction about the pin 283, against the action of the spring 287. In this position, the lever 282 (Figure 13) lies with its hook 289 directly below the lower tooth 278 of the lever 271, which continues to lie in the base position.

In this manner, with the depression of the correcting key 223 (Figure 1), the cartridge 26 has been set for a correcting operation, with its ribbon above the striking point, and the cartridge 24 containing the ink ribbon 25 has been locked with its ribbon below the striking point without any obstacle to the visibility of the zone to be corrected. If the correcting key is kept depressed while the cartridge 26 remains in its correction position, the back-space cycles of the cartridge 35 are repeated for the required number of times by means of the lever 237 (Figure 11), in known manner.

When the cartridge 26 has been thus set for the correcting operation, and the carriage 35 positioned in front of the character to be erased, the key corresponding to the character to be erased can be depressed. This selects the hammer 22 for the character to be corrected, and rotates the shaft 54 (Figure 10) and the cam 57 keyed on to it through 120°. By way of the lever

59 and the connecting rod 63, this rotation causes the lever 68 and the lever 202 connected to it to rotate clockwise. As its lug 199 is located in front of the upper end of the lever 202, the lever 198 also rotates in an anticlockwise direction and moves the connecting rod 207 towards the left, to cause the lever 219 to rotate in an anticlockwise direction and thus bring its lug 222 in front of the lugs 157 of the lever 148. In addition, the lug 222 has slightly raised the lever 180 (Figure 9), and has replaced it in the locking of the lever 140. In this action, the lever 140 takes up the slack between the lever 180 and lug 222, by rotating slightly in an anticlockwise direction (Figure 3) until its lug 157 halts against said lug 222. At the same time, the bridge lever 208 rotates in an anticlockwise direction to move into the position shown by dashed lines in Figure 10. In this manner, the slot 216 enables the pin 124 of the lever 122 (Figure 7) to rise under the action of the spring 126, with a clockwise rotation of the lever 122 and the lowering of the lever 112 in the position shown by dashed lines in the figure. Consequently, by pivoting on the levers 109 and 111 which have remained practically at rest, the plate 104 rotates slightly in a clockwise direction, to move the fork 102 downwards, with the correcting ribbon 27 over the typing point O. In the meantime, the hammer 22 corresponding to the depressed typing key, is thrown by its linkage and strikes against the platen 23; it encounters the interposed correcting ribbon 27 and thus erases the erroneous character from the paper.

When the saft 54 (Figure 10) and cam 57 have terminated their 120^{o} rotation, the connecting rod 207 returns to rest, thus moving the cartridge 26 into the horizontal position. Simultaneously, the lever 219 rotates clockwise and releases the lever 148 which, under the action of the spring 201 (Figure 3), rotates in an anticlockwise direction until it reaches the rest position, thus closing by means of its peg 146 the articulated parallelogram constituted by the levers 109, 111 and 112, and thus returning the support 104 and cartridge 26 (Figure 6) to the lowered position.

Simultaneously with the lowering of the fork 102 of the cartridge 26 as heretofore described, the cam 57 in rotating through 120^{o} also rotates the lever 284 (Figure 11) in a clockwise direction about the shaft 286 by way of the end 304 of the lever 59,

which rises, and the lug 302. As the lever 299 is prevented from rotating because it is locked by the tooth 297 which is raised, this rotation of the lever 284 does not produce any consequent rotation of the lever 299 and shaft 286. The lever 320 thus remains in its rest position, with the escapement tooth 321 engaged with the rack 322. There is therefore no movement of the carriage 35 towards the left (Figure 1).

In rotating clockwise, the lever 284 (Figure 13) raises the lever 282, which by means of its tooth 289 engages the tooth 278 of the lever 271, and rotates this latter in an anticlockwise direction to return it to its initial position. The lever 256 is also returned to its rest position, raised by the fork 269, so that its lug 254 (Figure 12) is hooked to the tooth 257. Consequently, the levers 92 and 168 (Figure 11) rotate clockwise by the action of the spring 90 until in their rest position, so releasing the stop 89. Moreover, the lever 243 has followed the lug 254 and returns the tooth 249 to the left of the contour 252 of the lever 253. In known manner the dead key frame 292 returns to rest as the tooth 279 of the lever 256 is raised, and returns the connecting rod 296 upwards s- that it releases the tooth 297 from the lever 299, and the entire mechansim thus returns to its rest position.

However, if it is required to release the typewriter from its correction setting and restore it to its initial state, the spacer bar 309 (Figure 1) is pressed after pressing the correcting key 223 but before pressing a typing key. This causes the spacer bar lever 306 (Figure 9) to rotate in an anticlockwise direction on the fulcrum 307, and thus the blade 311 to rise (position shown by dashed lines in the figure). In this manner, the lever 180 is raised against the action of its spring 190, and the lever 148 rotates in the anticlockwise direction (Figure 3) under the action of the spring 201 until it reaches the rest position, pulling with it, by means of its peg 146, the levers 109, 111 and 112 and thus also the cartridge 26.

The removal of the cartridge 26 (Figure 6) for its replacement is effected very simply, against the action of the strips 115 and 120. The force transmitted to the support 104 has on the other hand no effect on its position, which remains the lowered rest position. This is because the lever 148 (Figure 2), directly

connected to the lever 109 of the articulated parallelogram, is prevented from rotating clockwise by the lug 189 of the bridge lever 92, 168, disposed in front of the edge 188 of the arm 154.

Any delay in the return to rest of the cartridge 26 at the end of a correcting cycle does not give rise to any interference between the lug 189 and arm 154. The circular edge 187 (Figure 2) retains the lug 187 against the action of the spring 90, so preventing the rest lug 189 from hindering correct positioning of the lever 148. The lug 189 can return to its rest position by freeing itself from the edge 187 only if said lever 148 has not been exactly returned to its rest position.

The presence of the correcting device does not substantially change the normal operations of the typewriter. For example, during a back-space cycle of the cartridge, the cam 181 (Figure 8) gives rise to a to-and-fro movement of the connecting rod 163. On the other hand, when in the non-set state, the slot 167 keeps the trajectory of the tooth 158 out of range of any interference with the edge of the arm 158 of the bridge lever 148, and the support 104 thus remains in its lowered position.

During a normal typing cycle, the reciprocating movement of the lever 202 has no effect on the correcting device because the lug 199 (Figure 3) which controls the lowering of the correcting ribbon is disposed outside the trajectory of the lever 202. If the correcting key is operated before a typing cycle has not yet been completed, no incompatibility problem is created. In this respect, if the lever 202 is not yet in its rest position, when the bridge 148 urges the bridge 197 towards the left by means of the lever 193, it can only halt its lug 199 against the side of said lever 202 and stretching the spring 201. The correct positioning of the lug 199 in front of the edge 188 takes place only if the lug 202 has not returned to its rest position.

It is apparent that modifications can be made to the described embodiment. For example, if the machine uses a cartridge with a lateral arm which moves relative to the container under the action of a ribbon vibrator, the locking mechanism will act directly on the vibrator or on parts connected thereto. If the cartridge containing the correcting ribbon comprises a moving lateral arm, after setting the cartridge for the correcting operation, the

ribbon will be moved to the striking positioning mechanism acting directly on the lateral arm rather than on the support for the cartridge.

CLAIMS

1. A hammer typewriter with a cartridge containing a typing ribbon disposed to one side of the typing point and movable from a rest position in which the ribbon is below the typing point to allow visibility of the typed line, to a working position in which the ribbon is in front of the typing point for typing by the selected hammer, characterised by a cartridge (26) containing a correcting ribbon (27), which is disposed on the opposite side of the typing point (O) to the cartridge containing the typing ribbon (25), and by an erasing device operated by a correcting key (223), which locks the cartridge containing the typing ribbon in its rest position, and moves the cartridge containing the correcting ribbon into proximity with the typing point (O) for the subsequent erasing of the character to be erased.

2. A typewriter according to claim 1, with a clutch for operating the selected hammer, characterised in that the cartridge (24) containing the typing ribbon is carried by a support (31) moved by a spring (43) under the control of a cam (53) operated by the clutch, and the erasing device comprises a hook element (91) arranged to keep the support (31) in an operative position against the action of the spring (43).

3. A hammer typewriter comprising a support for a cartridge with an active portion of the correcting ribbon disposed to one side of the typing point, characterised by a correcting key (223) and a setting mechanism (181, 163, 159, 158, 148, 146) put into action by the operation of the correcting key which moves the support (103) into a setting position in which the active portion of the correcting ribbon (27) is disposed in proximity to the typing point (O), and means (Fig 10), governed by the setting mechansim and controlled by the operation of the typing keys, which move the correcting ribbon in front of the typing point for erasing the character to be corrected.

4. A typewriter according to claim 3, characterised in that the support (103) is part of an articulated parallelogram (109, 111, 112, 122, 104), and the setting mechanism (181, 163, 159, 148, 146) changes the configuration of the parallelogram in order to move the support into the setting position for the correcting cartridge (26).

5. A typewriter according to claim 4, characterised in that the said controlled means (Fig 10) further change the configuration of the parallelogram in order to move the correcting ribbon (27) in front of the typing point (0).

6. A typewriter according to claim 4 or 5, characterised in that the parallelogram comprises two levers (109, 112) pivoted on the support (104), of which a first lever (109) is pivoted on a fixed pin (113) and the second lever (112) is pivoted on a third lever (122) pivoted on the fixed pin (113).

7. A typewriter according to claim 6, characterised in that the setting mechanism (181, 163, 159, 158, 148, 146) acts on the first lever (109) pivoted on the fixed pin (113), while maintaining the third lever (122) substantially at rest, and that the controlled means (Fig 10) act on the third lever (122) in order to move the support (104) which moves the correcting ribbon (27) in front of the typing point (0).

8. A typewriter according to claim 6 or 7, characterised by a fourth lever (111), pivoted on the support (104) and on the fixed pin (113) and bridge-connected to the first lever (109).

9. A typewriter according to any of claims 3 to 8, characterised by a feed member (134) for the correcting ribbon (27) mounted on the support (104) and by a ratchet mechanism (132, 133) mounted on the support (104) and operable in response to the setting of the cartridge (26) in order to make an incremental rotation of the feed member.

10. A typewriter according to claim 6 and 9, characterised in that the ratchet mechanism comprises a toothed wheel (133) connected to the feed member (134) in order to rotate it, and a tooth (132) which is movable on the support (104) and is engaged with the toothed wheel and pivoted on one of the levers (109) pivoted on the support.

11. A typewriter according to any of claims 3 to 10, characterised in that the setting mechanism (181, 163, 159, 158, 148, 146) moves the support (104) from a lower position in which the active portion of the correcting ribbon (27) is below and to one side of the typing point (O), to an upper position in which the correcting ribbon is directly above the said point.

12. A typewriter according to claim 11, characterised in that the support (104) is normally kept in its lower position by corresponding spring means (126), is moved into its upper position by the action of a cam (181) of the setting mechanism, and is retained in the upper position by a tooth (200) released by the setting mechanism.

13. A typewriter according to claims 4 and 12, characterised in that the said cam (181) acts on a lever connected by a pin and slot (146, 144) to the first lever (109) of the articulated parallelogram.

14. A typewriter according to claim 11, 12 or 13, characterised in that the said controlled means (Fig 10) comprise a control member (214) moved with reciprocating motion at each typing cycle of the machine, and the said setting mechanism comprises a member (122) connected to the support (104) which is disposed in the trajectory of the control member, in order to lower the active ribbon portion in front of the typing point (O).

15. A typewriter according to claims 7 and 14, characterised in that the member connected to the support (104) comprises the said third lever (122) which cooperates with a cam profile (216) driven by the control member (214).

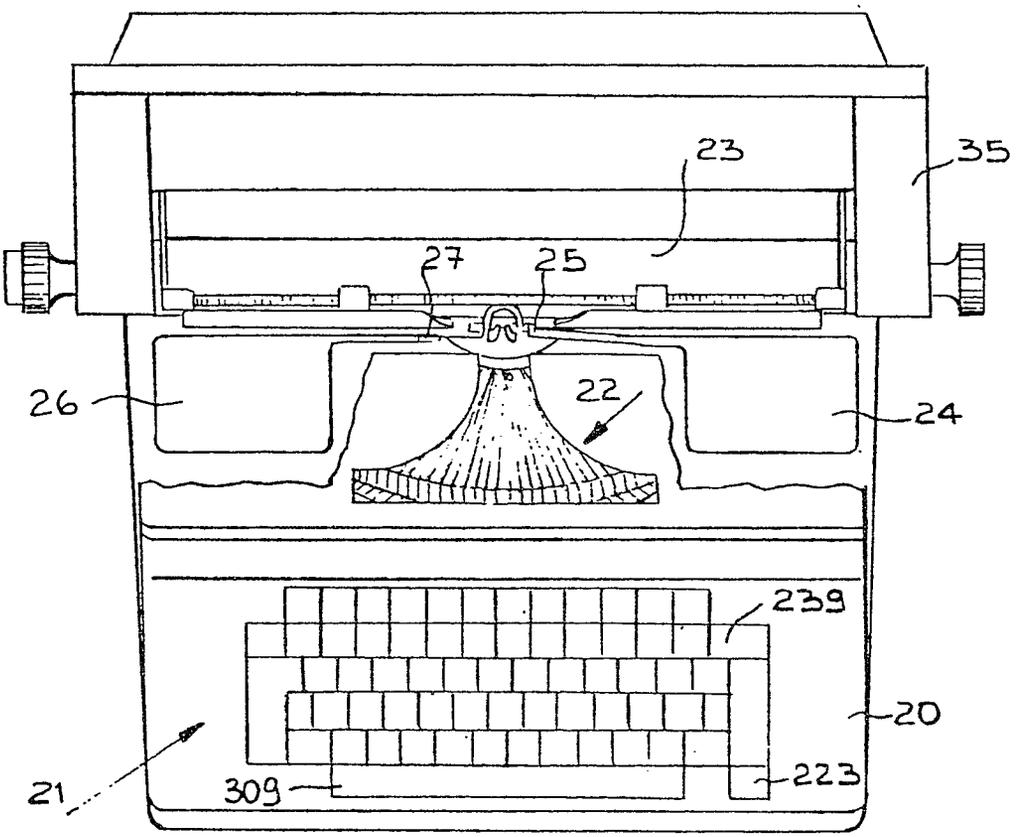


FIG. 1.

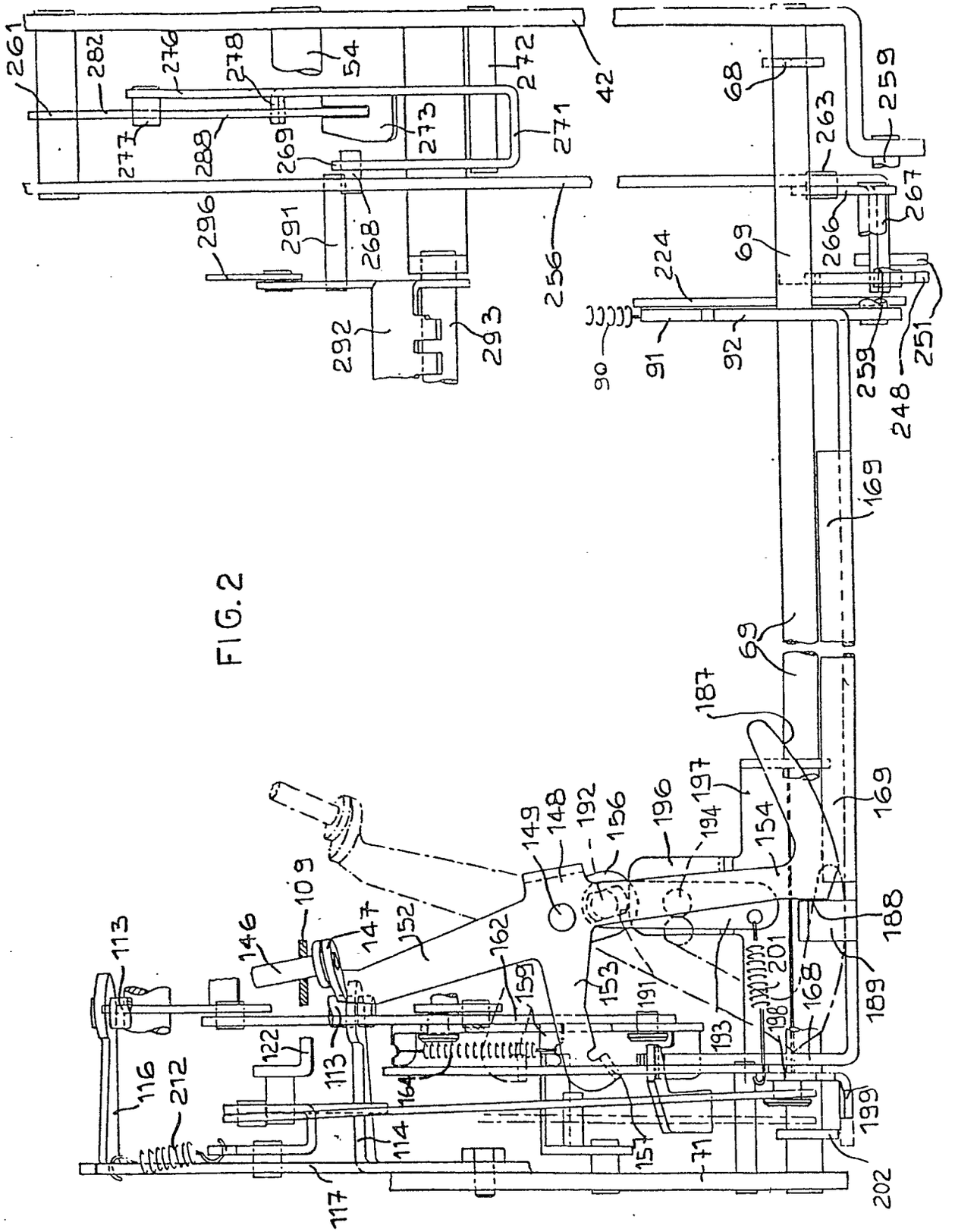

261
282
276
278
54
272
42
68
259
277
288
269
273
271
263
267
296
291
268
256
266
69
224
292
293
90
91
92
259
251
248
169
69
187
197
194
196
156
192
148
149
154
109
146
147
152
162
188
113
153
191
201
168
189
159
193
198
122
116
212
164
114
157
71
199
202
117

FIG.2

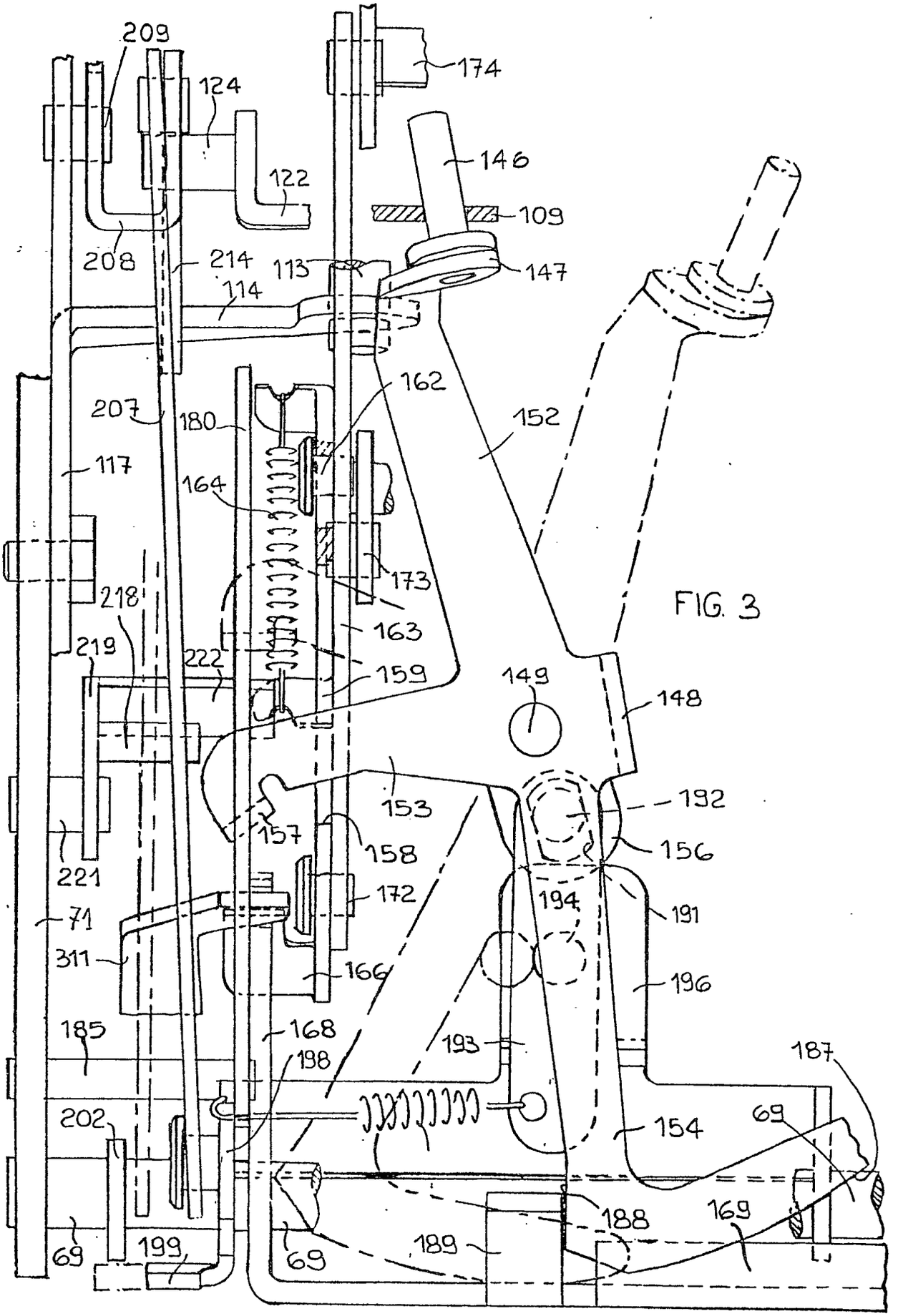

209
124
174
122
146
109
208
214
113
147
114
162
207
180
152
117
164
173
218
163
219
222
159
149
148
153
192
157
158
156
221
172
194
191
71
311
166
196
185
168
193
187
198
202
154
69
188
169
199
189
69
69

FIG. 3

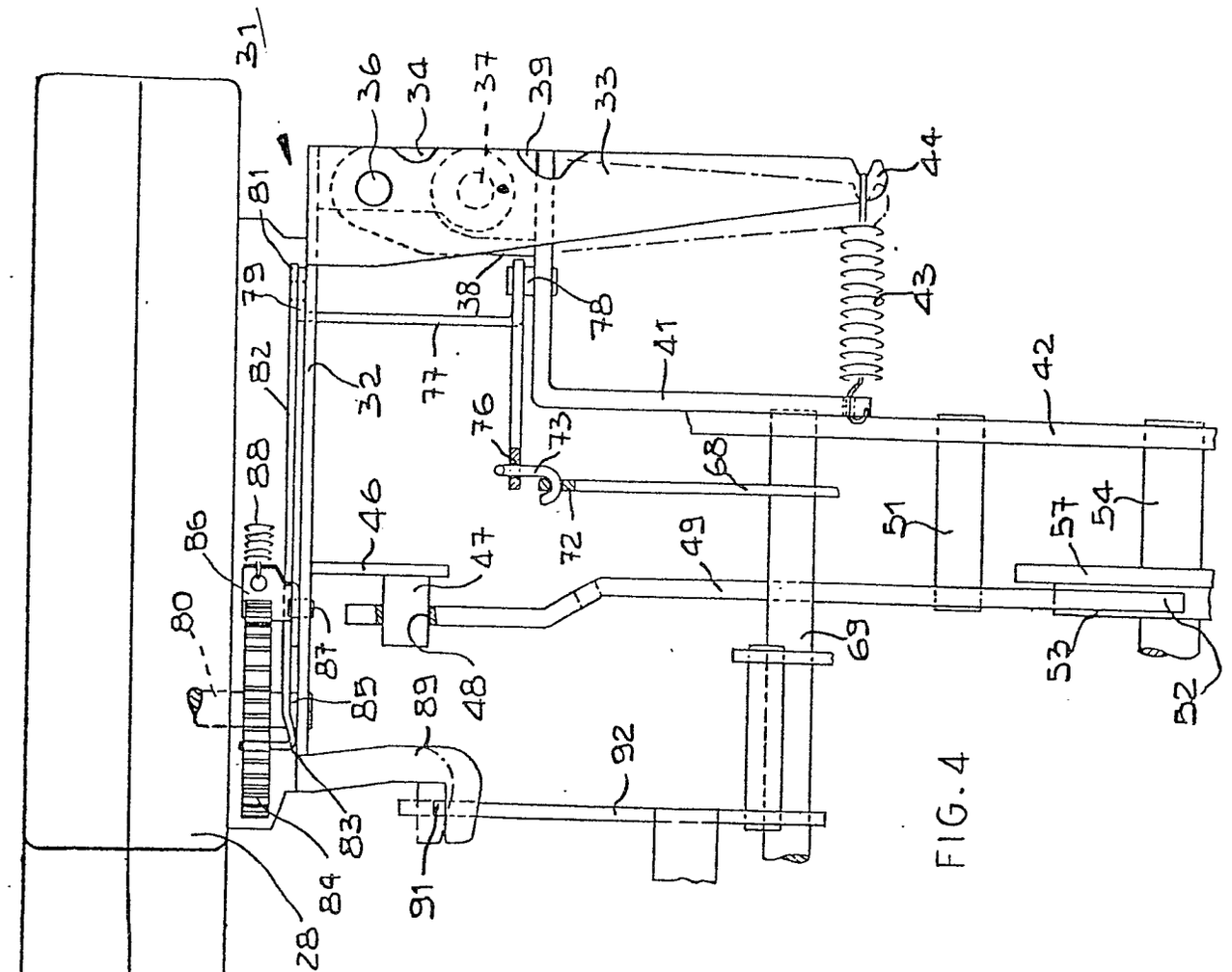


FIG. 4

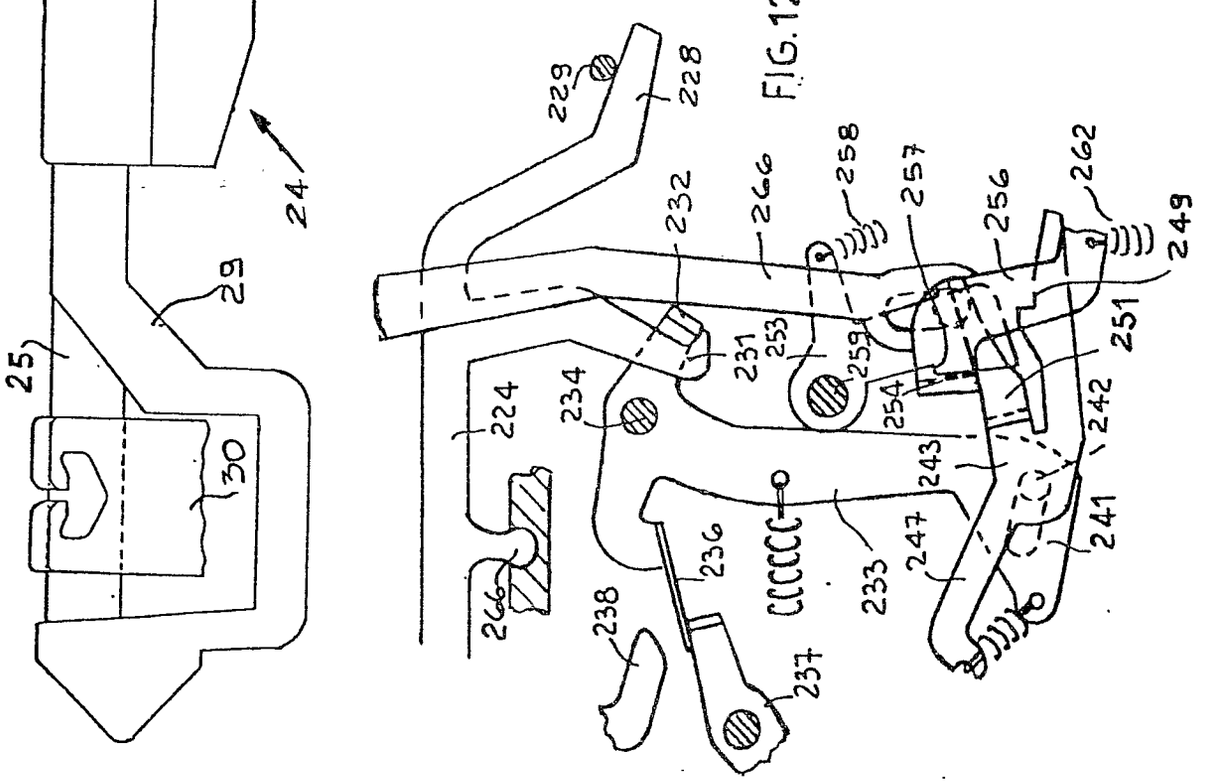


FIG. 12

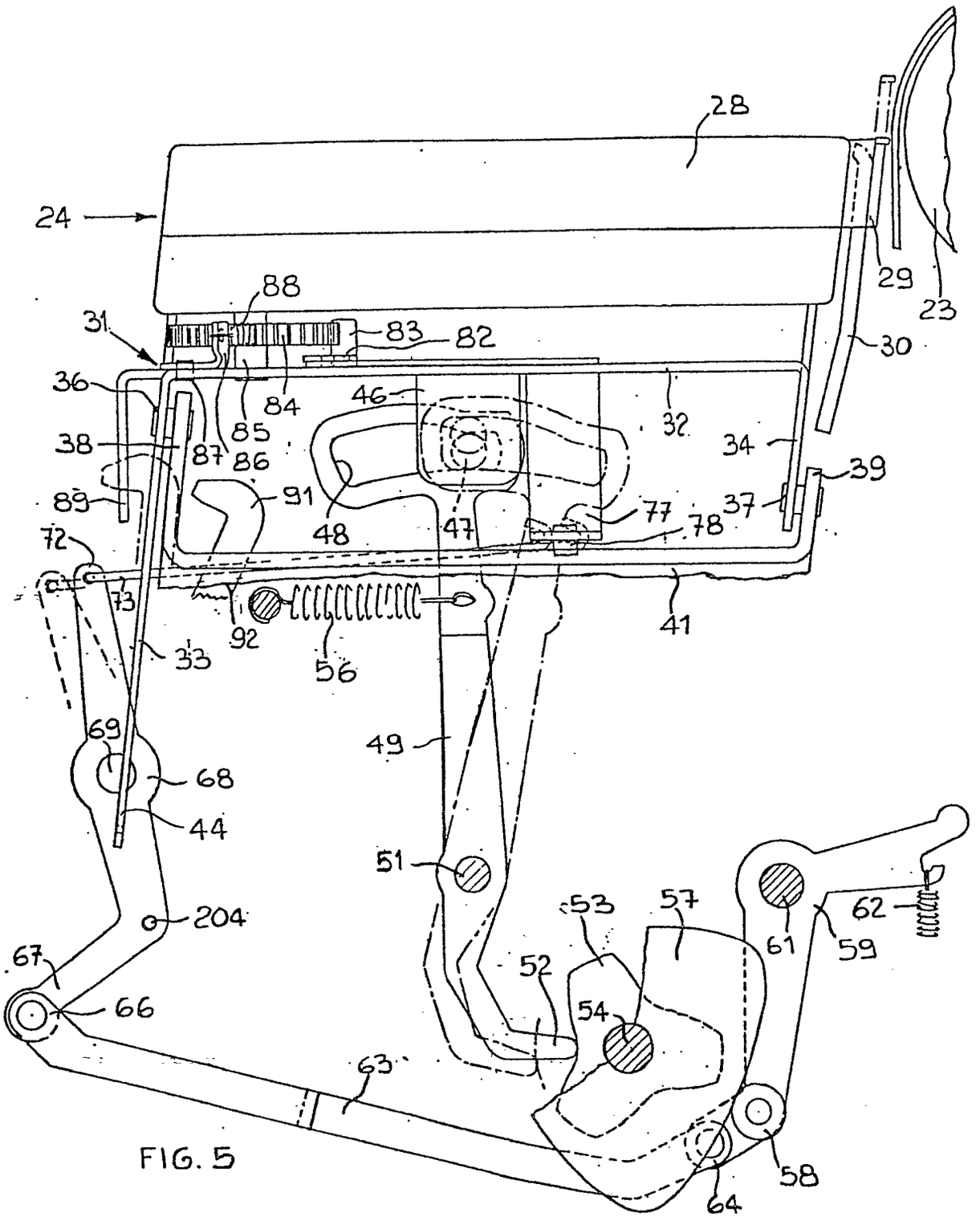

28
24
29
23
88
31
83
82
30
36
84
46
32
85
38
87
86
34
39
89
91
48
47
77
37
78
72
73
41
92
56
33
69
49
68
44
51
204
53
57
62
61
59
67
52
66
54
63
58
64

FIG. 5

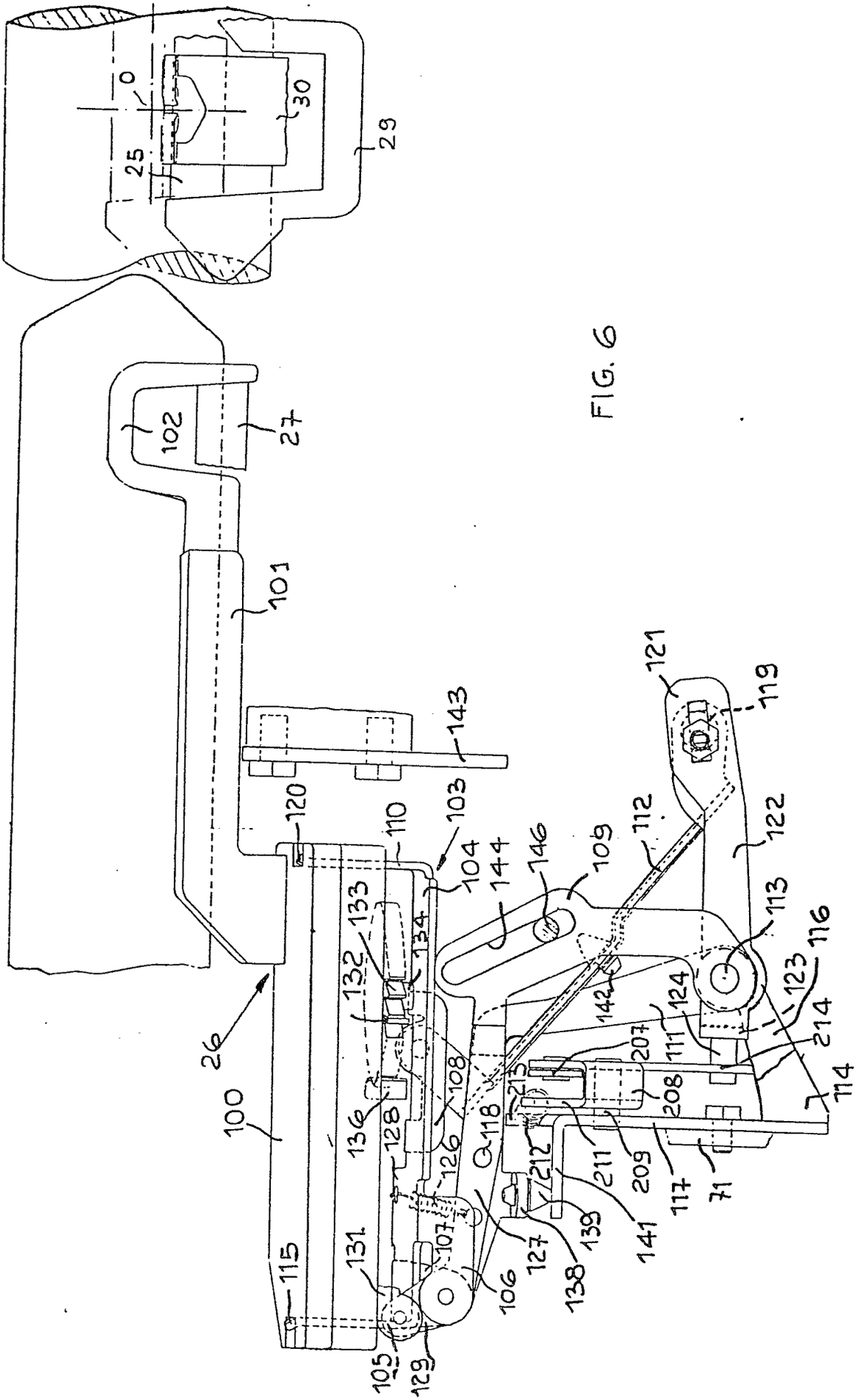

0
30
25
29
102
27
101
143
120
110
103
104
144
146
109
112
121
119
122
133
134
132
113
116
123
214
124
111
207
142
26
100
136
128
108
213
208
118
126
212
211
209
117
71
714
107
127
139
141
138
106
131
115
105
129

FIG. 6

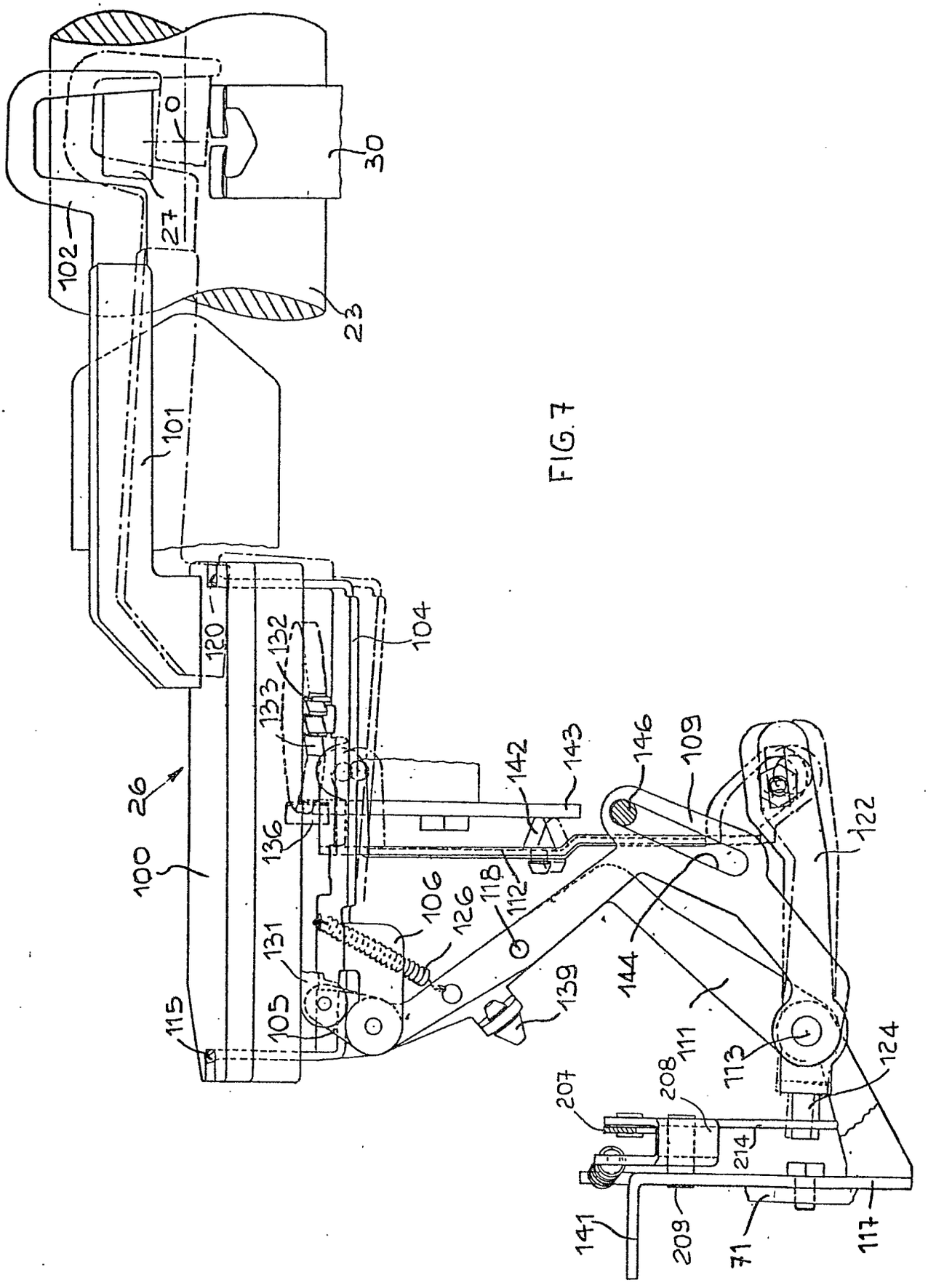
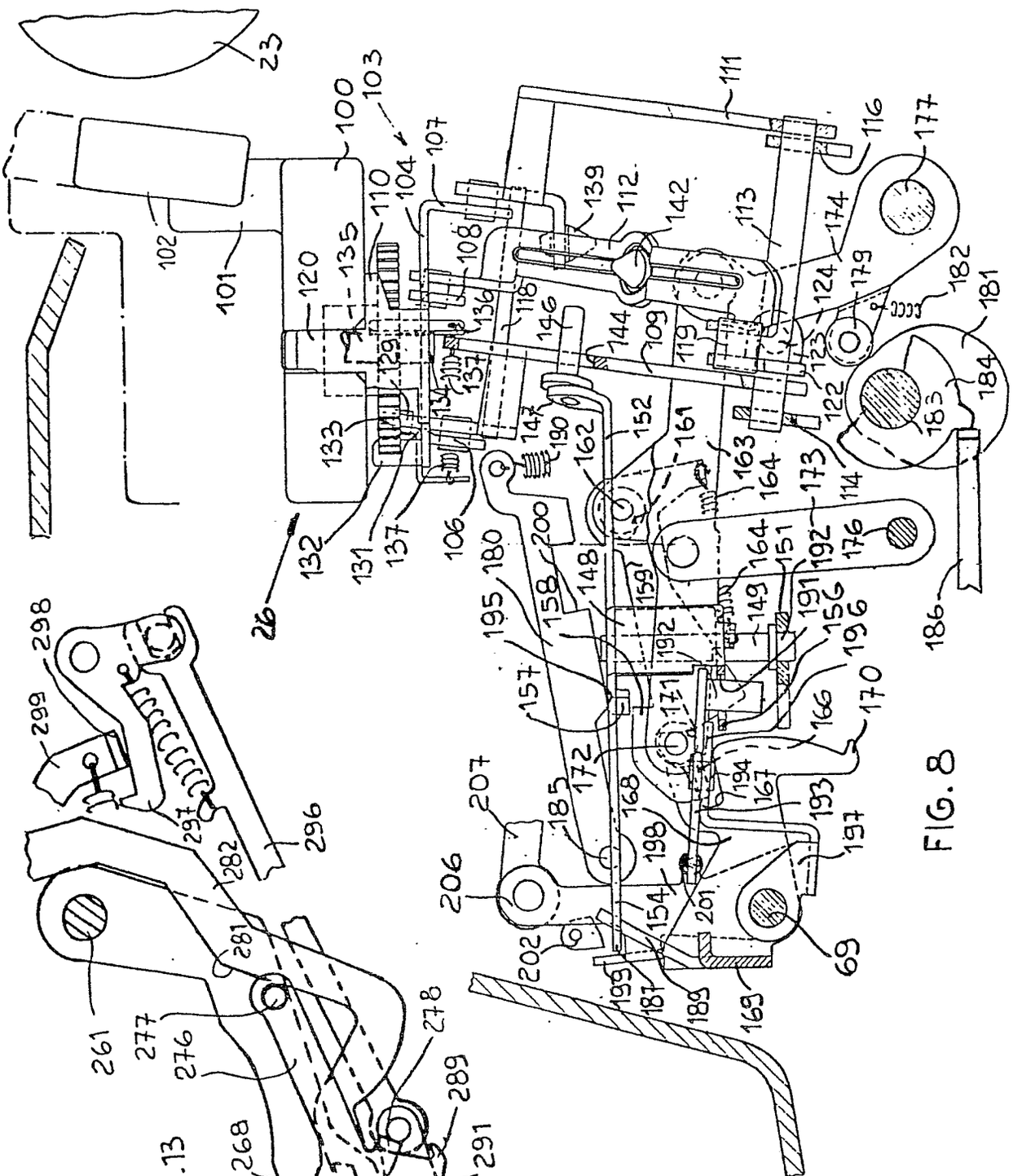

30
27
102
23
101
120
132
104
133
26
100
136
142
143
146
109
122
106
126
118
112
131
105
115
139
144
111
113
124
207
208
214
141
209
71
117

FIG.7


23
100
103
107
104
110
102
101
120
135
108
136
118
146
144
109
119
139
112
142
113
111
116
177
174
124
179
182
181
184
183
122
123
114
173
163
164
161
152
162
190
143
137
129
133
131
132
26
106
180
200
148
158
159
149
151
192
176
186
195
157
191
156
196
171
166
170
172
168
194
167
193
197
185
198
207
206
202
154
201
69
199
187
189
169
FIG. 8
298
299
297
282
296
261
277
276
281
278
289
291
268
269
279
293
272
271
256
FIG. 13

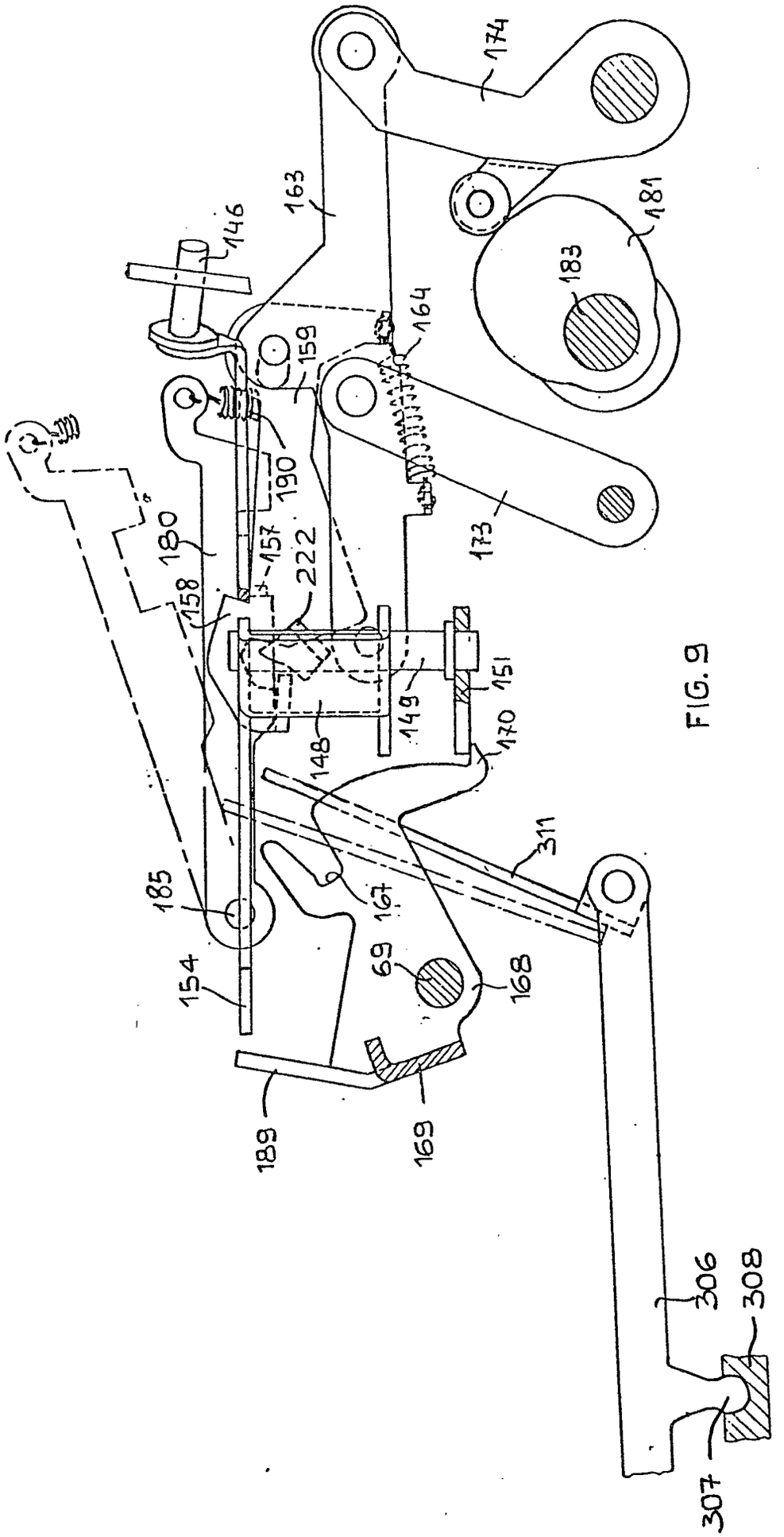

174
163
146
181
183
164
159
190
180
157
222
158
173
151
149
148
170
311
185
167
69
154
168
189
169
306
308
307

FIG. 9

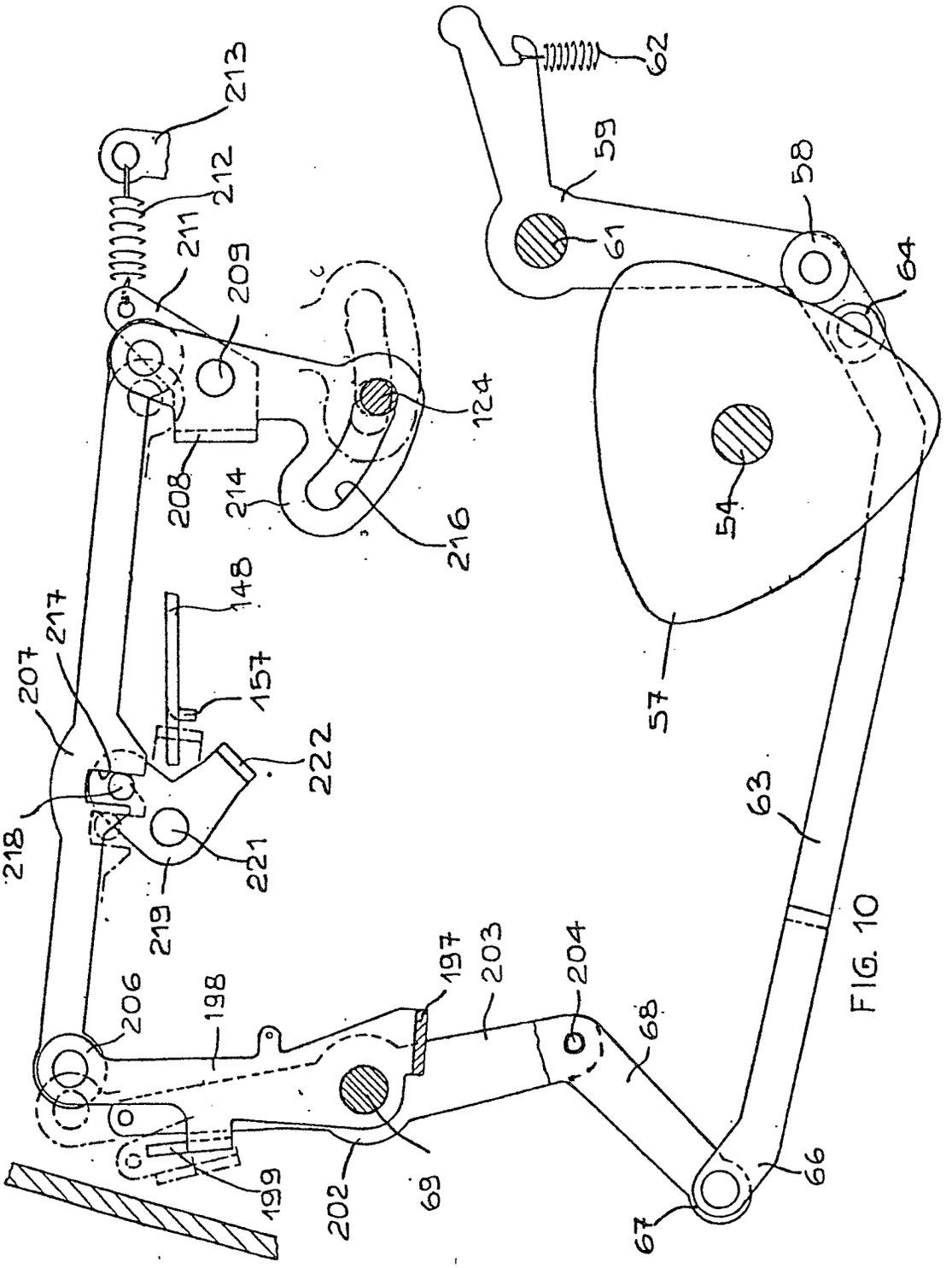

213
212
211
209
208
214
216
124
148
157
222
221
219
218
207
217
206
198
197
203
204
68
69
202
199
67
66
63
57
54
64
58
61
59
62

FIG. 10

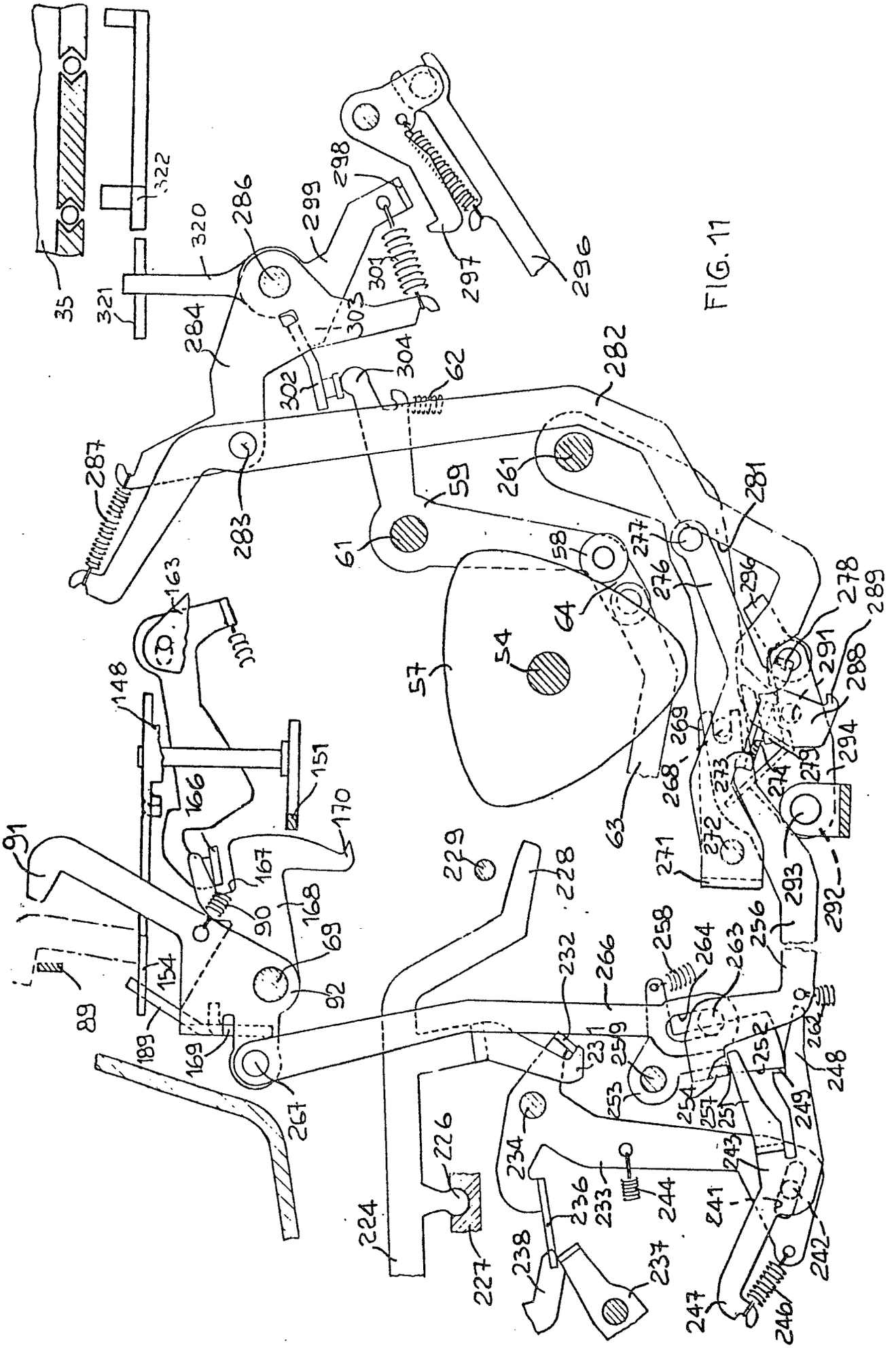


FIG. 11

European Patent Office

EUROPEAN SEARCH REPORT

Application number
EP 81300581.6

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
	US - A - 3 980 171 (FRECHETTE) + Column 1, lines 45-55; column 2, lines 9-14, 61-67; column 4, lines 17-34; fig. 1 + ----	1,7,11

CLASSIFICATION OF THE APPLICATION (Int. Cl.³)
B 41 J 33/00

TECHNICAL FIELDS SEARCHED (Int. Cl.³)
B 41 J 33/00

CATEGORY OF CITED DOCUMENTS
X: particularly relevant
A: technological background
O: non-written disclosure
P: intermediate document
T: theory or principle underlying the invention
E: conflicting application
D: document cited in the application
L: citation for other reasons

&: member of the same patent family, corresponding document

X The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
VIENNA	05-05-1981	KIENAST