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

(11) Publication number: **0 008 279**
A2

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **79830023.2**

(22) Date of filing: **20.07.79**

(51) Int. Cl.³: **B 41 J 32/00**, B 41 J 33/18, B 41 J 33/512, B 41 J 35/04

(30) Priority: **03.08.78 IT 2643778**

(43) Date of publication of application: **20.02.80 Bulletin 80/4**

(84) Designated Contracting States: **BE CH DE FR GB NL SE**

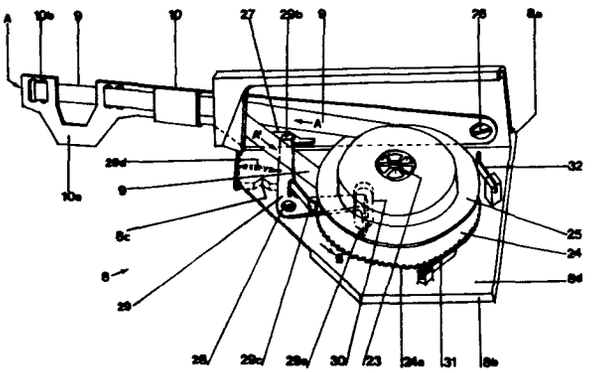
(71) Applicant: **Antolini, Camillo, Via Castello 25, I-26025 Pandino (Cremona) (IT)**

(72) Inventor: **Antolini, Camillo, Via Castello 25, I-26025 Pandino (Cremona) (IT)**

(74) Representative: **D'Orio, Aldo, Via Francesco Sforza 5, I-20122 Milan (IT)**

(54) A removable cartridge for typewriter inked ribbon and a relative typewriter.

(57) The invention is related to a removable cartridge for typewriter inked ribbon and the relative typewriter, wherein said cartridge encloses two superimposed or juxtaposed step by step rotating spools for unwinding from a spool and rewinding to the other spool an inked ribbon, that is guided by a swinging arm up to the operating zone of the types, a swinging lever being provided having an arm moved by a blade receiving swinging movement by the typewriter, an arm sliding along a cam slit provided on the swinging arm to swing the same and a third arm engaging a crown gear provided on the edge of at least one of said spools, to rotate step by step said spools.



EP 0 008 279 A2

A removable cartridge for typewriter inked ribbon and a relative typewriter

The invention is related to a particular cartridge for inked ribbon and a typewriter adapted for its employ, which typewriter is foreseen to raise the roller carriage to pass from small letters to capital letters and said particular ribbon carrier cartridge is moved integrally with said roller carriage for the passage from small letters to capital one. According to said invention said cartridge contains two spools, one spool being apt to unwind the ribbon and the other spool to wind the same ribbon, the latter being carried before the operated types by an arm articulated to the same cartridge, which arm is raised by oscillation at each operation with means inside the cartridge, which means provide further for the advancing movement of the same ribbon.

Many types of ribbon carrier cartridges for typewriters and relative typewriters are known, on said typewriters the cartridges are mounted and operated, said cartridges presenting different disadvantages according to the disposition of the spools and the means provided for advancing same. The types of cartridges having separated

and spaced spools, the ribbon of which is positioned before the operated types within the interval of the two spools, are very large, cumbersome and difficult to replace.

Further, because of their structure, said cartridges are very expensive and are apt only for relatively important machines. The latter must be also of the type wherein the passage from small letters to capital one is accomplished by a movement of the whole type assembly.

Another type of known cartridges, the spools of which are, nevertheless, both located in a side, presents the disadvantage that the ribbon is deviated at the end of the support arm, in order to slide parallely to itself and on the same plane, after being subject to two deviations, which renders difficult the ribbon return and produces a remarkable friction, such as to require particularly strong ribbons and suitable advancing and rewinding means, sometimes motorized.

The typewriter according to the invention with the relative particular cartridge completely solves the problem of feeding and replacing the ribbon, as the cartridges can be manufactured in an easy and economical way, while the inked ribbon can be of any type, having a height sufficient only for the capital types; for this reason it becomes possible to employ the cartridge only once and further it is possible to invert the ribbon rotation with self-regerating ribbons and to use said ribbon for a

lot of times without replacing it. To this end, the typewriter, according to the invention, provides for means raising the roller carriage for the operation of the capital letters and means raising likewise the whole cartridge together with the said carriage, so that the relative position between the ribbons and the paper carrier roller does not change during the typing. In addition it is foreseen, according to the invention, to pass, in correspondance with the operation zone, the ribbon on itself using particularly thin ribbons, the width of which is that required by the highest capital letter.

It is also foreseen, according to the invention, to employ long life ribbons by providing means for the inversion of the advancing movement of the ribbons and to replace the exhausted ribbon utilizing the same cartridge for a new ribbon.

More particularly, according to the invention, the typewriter is composed by a swinging support for the roller carriage, on said support a ribbon carrier cartridge is applied, said support being operated by the capital letter key, which key provides, be means of levers and tension rods, to raise the carriage and cartridge assembly up to the position requested for typewriting the capital letters.

Therefore the ribbon remains in the same relative position with respect to the paper carrier roller, while

the ribbon is carried before the small and capital types according to the position assumed by the capital key. Said cartridge comprises, according to the invention, a casing into which are disposed two spools which can be coaxial, superimposed and idle on a common shaft or juxtaposed, on said spools the ribbon is unwound from one spool and rewound to the other spool. Pivoted on said casing and substantially parallel to the paper carrier roller axis, a swinging arm is disposed, the latter guiding the ribbon in the forward movement up to its fork-shaped end, wherein the ribbon is inverted passing on itself, and in the backward movement.

The winding movement to the respective spool is furnished by a swinging lever, pivoted inside the casing and having three arms. A first arm of said lever passes through the casing bottom and projects below, the second arm slides along a cam shaped slit of said swinging arm and the third arm, acting as a spring for being constituted by a resilient strip, engages inclined teeth obtained on the ribbon winding spool edge.

In combination with said swinging lever there is provided, in the typewriter, a blade or the like pivoted in the lower portion of the same typewriter and connected through a tension rod or the like with the typewriter universal bar operated, as it is known, by any key of the same machine. Said swinging blade engages, in its turn, the first arm of said swinging lever.

Therefore at each movement of the universal bar, said swinging lever is operated, and consequently the second arm of the same swinging lever operates, in its turn, the ribbon-carrier arm raising it up to the level necessary to position the ribbon section between the two branches of the fork before the type to be printed. The third arm of the same swinging lever executes also a swinging movement and advances step by step, the spool provided with a crown gear engaged by said third arm. To the end to avoid an undue return of the spool which has been displaced of a step, when said third arm returns back, there is provided a resilient stop, that interferes with a tooth of said crown gear so as to prevent the rotation in the opposite direction.

There is also provided, even if not necessary, a friction brake for the unwinding spool, so that the ribbon remains always in tension along all the travel.

At each operation, the ribbon carrier arm swings carrying the ribbon between the type and the paper carrier roller, while at the same time the winding spool causes the ribbon to advance a step presenting a new portion before the type for the operation.

Since the ribbon returns on itself superimposing in the section comprised between the two branches of the fork at the end of the ribbon carrier arm, the type, which is operated, leaves a written impression pressing on the refolded ribbon, that is, substantially on a ribbon having

a double thickness. This could constitute a disadvantage with ribbons having a large thickness, nevertheless it is now possible to have available very thin and flexible ribbons. For this reason the typing clearness does not suffer from the double thickness of the ribbon, when said ribbon is superimposed. Said cartridge is inserted in a housing rigidly connected with the movable roller carriage through a hook or the like disconnectable by operating an easy-to-handle outer button.

According to the invention there is also provided, as a variation, that the ribbon can be emploied again for a plurality of times inverting the winding direction at the end of the spool unwinding. To this end each of the two coaxial and juxtaposed spools is provided with a respective crown gear while the third arm of the swinging lever is divided in two parts with relative teeth apt to engage either crown gear of the two spools.

In order to impress the movement only to one of the two spools and more precisely to the spool on which the ribbon must, in that moment, wind, one of said teeth of the said third arm is carried out of engagement with the respective crown gear, through a bistable swinging arm, carried in either stable position by means of a follower in the form of a rocker lever contacting the winding ribbon, and kept in such a position by an over-centre spring. Therefore the said follower contacting the winding ribbon, automatically passes the over-centre snap point of the spring when it reaches a certain position of full spool, carrying the

bistable arm in the other position, for this reason the operating tooth, which was engaged with a spool, is carried out of engagement with the same spool, while the other tooth is at the same time carried in engagement with the other spool.

Said features and still further features will result from the following detailed description of a typewriter and a relative ribbon carrier cartridge shown by way of example in the accompanying drawings wherein:

Figure 1 is a top view of the typewriter complete with its essential members;
Figure 2 is a perspective view of the typewriter right side with the relative ribbon carrier cartridge;
Figure 3 is a view of the same right side of figure 2 without the ribbon carrier cartridge;
Figure 4 is a view in a greater scale of the ribbon carrier cartridge shown without the cover;
Figures 5 and 6 are side views of the typewriter of figure 1 in the two operating positions of the small and capital letters and of the operated key;
Figure 7 shows the ribbon carrier cartridge with means apt for the inversion of the rotation without the upper cover;
Figure 8 is a section view of the cartridge of figure 7 shown along the line VIII-VIII and
Figures 9 and 10 show, as figures 8 and 9, a variation of the cartridge provided with ribbon inversion and juxtaposed spools.

With reference to figures 1 and 2, the typewriter, shown in top and side views, is generally traditional and comprises a frame 1, a keyboard 2, a cover 3, a type assembly 4, a movable carriage 5 provided with a paper carrier roller 6 and a paper advancing lever 7. On the typewriter right side (in this case the position is given only for reference) near the carriage 5, a cartridge 8 is located comprising inside a ribbon 9 which projects from the cartridge housing and is guided on a ribbon carrier arm 10 combined with the cartridge on the backward side, as it will be explained afterwards.

With reference also to figure 3, where the same side of figure 2 is shown without the cartridge 8 and limited to the members concerning said invention, on the frame 1 of the machine a lever 11 is pivoted on which the roller carriage 5 is supported (together with a similar lever of the left side not represented) so that said lever 11 can swing around the pin 12.

In the below rested position, the roller carriage 5 presents the paper carrier roller 6 in a position apt to receive the operations of the type-bars with their lower type, generally small types; while in the raised position of the roller carriage, the roller 6 is positioned in front of the upper types, generally capital types, ciphers and the like, of the type bars 4.

The change of the position, from lowered to raised, is provided for the roller carriage 5 by acting on the lever

11 through the key "M" (capital), the tension rod 13, the lever 14 pivoted in 15, with the end 14a shaped as a fork and the pin 16 integral with the lever 11. The angular displacement of the lever 14 is limited by two stops 17--17a for the correct positioning of the roller carriage.

The same lever 11 is extended forwardly and supports rigidly a housing 18 provided with slide guides 18a-18b and a two-arm lever 19 pivoted in 20, having two ends 19a-19b of which the first end is provided with a hook 19'a for retaining the roller cartridge, and the second end is provided with a key 19'b projecting from the frame of the typewriter, while a spring 21 drawn between the housing 18 and one of the arms of the lever 19, tends to urge the hook shaped end 19'a toward the guide 18a.

On said housing 18, from the side opposite to the outer one and parallelly to the guides 18a-18b, a spring expeller 22 is provided. On said housing 18 there is inserted from the exterior said cartridge 8 with a movement parallel to the axis of the roller carriage 5 causing two longitudinal projections 8a-8b of the cartridge to slide along the guides 18a-18b of the housing, until the hook 19'a of the lever 19 is inserted into a lower recess 8c (figure 4) of the cartridge, retaining the latter in the inserted position. Therefore by operating the key M of the capital letters, all the roller carriage 5 raises swinging around the pin 12 and also said housing 18 with the cartridge 8 already monted, raises together with the carriage.

The above described means allowing said operation are shown in figure 5, where only the parts of the typewriter 1 are shown, said parts interesting the same operation and the position of said parts for typing small letters (key M raised) is indicated with a continuous line and the position assumed by the same parts for typing the capital letters (carriage 6 and cartridge 8 raised) is indicated with a short dashes line.

With reference to figure 4 there is shown in a greater scale the cartridge 8 provided with ribbon 9 carried by the arm 10, as before described, of the kind having spools superimposed each other and without inversion of the ribbon rotational direction, particularly a ribbon of the kind " to be wasted ".

Said cartridge 8 presents a two-part casing, one part being a lower base 8d and the other part being a cover 8e (figure 2), being inserted in the lower portion with snap means of known type, for example projections and recesses, teeth and the like not represented.

Onto said base 8d, two coaxial superimposed spools 24 and 25 are pivoted on a fixed axis 23, the lower spool being provided, at the edge, of the lower disk with a saw tooth crown gear 24a. Onto the upper spool 25 there is wound the ribbon 9, which ribbon projecting from the spool, passes on the arm 10 according to the arrow A, arrives at the end of the fork extension 10a of the same arm, turns around a fixed traverse 10b and comes back to wind around the lower

spool 24, as indicated by the arrow A'. Said arm 10 is pivoted on a pin 26 rigidly mounted on the back wall of the base 8d, as shown in figure 4, and carries a step-shaped slit 27 acting as a cam along the lower portion of the same arm.

Onto the same base 8d a swinging lever 29 is pivoted in 28, said lever having three arms of which the first arm ends with an appendix 29a downwardly directed and projecting from a window 30 of the base 8d; the second arm ends with a small tongue 29b, said tongue inserting in the said step-shaped slit 27 of the arm 10 and the third arm is constituted by a resilient strip or the like bent on the point 29c, said sheet engaging with the crown gear 24a of the spool 24. Against the same toothing, with the purpose of non-return, acts also the resilient sheet 31 rigidly mounted on the cartridge base 8d. A spring 29d constantly urges the lever 29 according to the arrow B.

A further resilient sheet 32 rigidly mounted on said base, has the function to brake the movement of the spool 25 to maintain in tension the ribbon 9 during its travel.

With reference to figures 3 and 6, said appendix 29a of the swinging lever 29, projecting from the cartridge base 8d, engages a blade 33 or the like pivoted in 34 on the base of the typewriter, said blade being urged to right by the spring 35 and to left by the tension rod 36 connected to the arm 37 of the universal bar 37a. Said universal bar 37a, as it is known, is operated by any key

of the keyboard 2, only one key is represented in figure 3 for clearness.

In figure 6 there is sidewise represented the typewriter 1 with the already cited members indicated in a continuous line, when they are in rested position and in short dashes line, when anyone of the keys 2 of the keyboard is pressed causing thereby the lever 33 to operate against the appendix 29a projecting from the cartridge 8 by means of the bar 37a and the tension rod 36 and to raise the arm 10 for carrying it before the type, which will be operated. Such a movement takes place both with the cartridge 8 lowered and when it is raised, because the appendix 29a projecting below the cartridge has a lenght such to remain in contact with the blade 33, even with the cartridge in a raised position (position for the capital letters) as shown in figure 5.

The operation of the typewriter with a relative cartridge provided with superimposed spools and without rotational inversion is the following:

The whole cartridge 8 is inserted in the typewriter 1 with a movement from right to left, parallel to the axis of the roller 6, said spool being inserted with the edges 8a-8b into the respective slide guide 18a-18b of the housing 18, until the hook 19'a of the lever 19 inserts into the recess 8c of the cartridge 8. The projecting appendix 29a of the lever 29 is disposed to the action of the blade 33, while the end 10a of the arm 10 is disposed in front of

and below the operating point of the type carrier bar 4.

By pressing any key 2, the movement of the blade 33 is generated, as already discussed (figure 6), therefore the lever 29 is operated determining the following results: the arm 29b sliding in the slit 27 of the arm 10 makes it swinging upwardly carrying the ribbon 9 of the end 10a in the operating position of the key bar 4; the arm 29c, with its own point engaged in the toothing 24a of the winding spool 24, let the ribbon slide disposing a new section of the ribbon side turned toward the roller 6 in front of the operating type.

The same movements take place on operating the keys 2 even when the key M of the capital letters has been previously pressed carrying the machine in the conditions shown in short dashes line in figure 5. Should be necessary to remove the cartridge 8 from its replacement, it is sufficient to press the button 19'b, which button acting on the lever 19 let the hook 19'a project from the recess 8c of the cartridge releasing the same cartridge and then the latter is expelled from the guides by the spring 22 (figure 3), which had been compressed upon the insertion of the same cartridge.

With reference to figures 7-8, there is shown, as a variation, an embodiment for cartridge apt to ribbons of the self-regenerating kind, for which ribbon is necessary to invert the winding direction at the end of each complete unwinding in order to re-employ many times the same ribbon.

The cartridge and the outer control members remain equal to those already described, while the control members inside the cartridge, remaining nevertheless substantially the same, are differently conformed to alternatively control two spools, rather than only one. In figures 7 and 8 members similar to those described are indicated with the same references and members differently conformed with other references.

Therefore the two coaxial spools rotatable around the axis 23 are provided everyone with a peripheral toothing on the lower edge and precisely the lower spool 24 has the toothed edge 24a and the upper spool 25 has the edge 25a toothed. The arm 29c of the lever 29 is modified and thereon a tension blade 50 is applied divided in two parallel arms having at their ends the hooks 50a-50b apt to engage in the crown gears 24a-25a.

The non return or retaining resilient strip 31 is divided in two arms with respective hooks 31a-31b engaged in the crown gears 24a-25a respectively and positioned below the hooks 50a-50b. In combination with said elements, a cam 51 is provided pivoted in 52 and carried in two stable positions by a lever 53 swinging around the pin 53a- said lever 53 being rigidly mounted on the follower arms 54-55 and controlled in said two extreme stable positions by a spring 56 disposed between a fixed point 57 and a movable point 58 of the lever 53, said two stable positions being obtained when the movable point 58 is located on a side or on the other side of the line joining the fixed point 57

and the rotational centre 53a. Said cam 51 presents two opposed profiles 51a-51b acting onto the two non return strips 31a-31b in order to alternatively raise either strip from the respective crown gears into which said strips are engaged, and raising at the same time also the hooks 50a-50b of the tension rod 50.

The operation of said embodiment, keeping in mind all the movements already described with reference to the cartridge with a sole winding ribbon, is the following.

Supposing that the ribbon winding takes place with the upper spool 25 and is at the point shown in figure 7, the follower 55, resting on the ribbon, retains the lever 53 in the position shown in continuous lines and in that condition the cam 51a raises the lower retained strip 31a, which strip, in its turn, raises the lower hook 50a, for this reason the upper spool is rotated of a step or tooth from the hook 50b at each operation winding the ribbon 9 thereon. As the diameter of the wound ribbon increases, the follower 55 and consequently the movable point 58 integral therewith, rotates around the axis 53a up to overcome the joining line of the points 57 and 53a and to snap at the other side. Such a movement rotates the lever 53 that , in its turn, displaces the cam 51 in the position indicated in short dashes lines, carrying the follower 54 in contact with the ribbon in the spool 24 and the upper profile 51b of the cam 51 in contact with the upper retaining strip 31b, so as the upper movement hook 50b is raised from the toothing 25a and the lower

hook 50a is engaged with the lower toothing 24a determining the rotation in opposite direction of the spool 24 and consequently the winding of the ribbon on the spool, from which spool the ribbon unwound in the previous cycle.

To the end to fit the cartridge according to this invention also in typewriters having the necessity to reduce the whole casing height, the cartridge thickness, determined substantially by the thickness of the two superimposed spools, can be reduced to that of only one spool disposing the same spools juxtaposed one another. Such an arrangement, as a variation, comprising also the ribbon movement inversion means, and therefore adaptable also for self--regenerating ribbons, is shown in figures 9 and 10 corresponding to figures 7-8 of the previous embodiment. Also in this case the members common to the already described embodiments have the same reference, while the members modified are indicated with the same reference with the addition of the apostrophe.

With reference to said figures 9-10 the spools 24 and 25 are disposed juxtaposed, idle rotatable, on two parallel shafts 23 and 23'. Each spool is provided with toothing at the lower edge 24a-25a respectively, as in the previous case. The three-arm control lever 29 is still the same, except for the third arm 29'c which is pin-shaped,on said third arm is applied the end of a horizontally slidable small bar 60, the other end of which is guided in a projection 61. To said slidable small bar 60, two resilient strips 50'-50" are rigidly connected having at their ends

the hooks 50'a and 50"b respectively apt to engage the toothings 24a-25a of the two spools.

Coaxial with the same spools and idle on the shafts 23-23' two cams 62-63 respectively are disposed everyone provided with a sector gear 62a-63a respectively and a projection 62b-63b respectively apt to rest against the resilient strips 64-65 connected to the casing base and extended upwardly up to abut, in their turn, against the free end of the resilient strips 50'-50" carrying the hooks 50'a-50"b. Said cam 62 presents further a recess 62c into which an arm 66 connected to the follower 54-55 is located. Said resilient strips 64-65, apt to cooperate with said projections 62b-63b of said cams 62-63 act as retaining or non-return teeth for the spools 24-25. To this end said strips 64-65, besides to be resilient, are inclined in order to be engaged constantly with the respective toothings 24a-25a of said spools. A double resilient strip brake 32'-32" rests on both the spools accomplishing a braking action for drawing the ribbon.

Supposing known all the common movements already described, the operation of said embodiment provided with juxtaposed spools is the following: the ribbon 9 is in winding operation on the right spool 25 and the follower 55 is in contact with the same ribbon. The rotation movement, step by step, is furnished to the same spool 25 through the toothing 25a and the hook 50"b operated by the lever 29 with the above described means combined with the typewriter and through the sliding bar 60 into the guide

61.

As the ribbon is wound on the spool 25, the winding diameter increases and displaces the follower 55, and consequently also the movable point 58, more and more outwardly, until the movable point 58 overcomes the line joining the fixed points 57 and 53a causing the spring 56 to snap to the other side and thus the follower 54 abuts on the ribbon of the spool 24. Such a movement rotates the arm 66 mounted on the followers and consequently, through the recess 62c, the cam 62 is rotated and through the toothings 62a-63a, the cam 63 is also rotated.

Such a movement carries the projection 63b of the cam 63 against the resilient strip 65 displacing it outwardly leaving free the toothing 25a of the non-return strip and displacing outwardly the strip 50" with the corresponding hook 50"b, said hook being thereby moved away from the said toothing 25a.

The opposite operation takes place with reference to spool 24 owing to the movement of the cam 62, which cam moves away the projection 62b from the strip 64 and therefore renders free the strip 50' allowing thereby the hook 50'a to engage the toothing 24a of the spool 24, and the strip 64 to engage the same toothing 24a, for the purpose of non-return. To the following typing movements, the ribbon 9 is moved in the opposite direction and wound on the spool 24 and so on.

According to this invention, also in the two embodiments shown in figures 7 to 10, regarding cartridges for self--regenerating ribbons and consequently provided with means inverting the movement, it is possible to employ the known non self-regenerating ribbons emploiable only once. In this case, being unnecessary the movement inversion, the means apt to accomplish said movement can be eliminated, leaving exclusively the parts necessary for a unidirectional winding. Consequently in the example of figure 7,remain the advancing tooth 50a, the non-return tooth 31a and the brake 32a; in the example of figure 9, remain the advancing tooth 50', the non-return tooth 64 and the brake 32'. Of course it is not possible to employ said non self-regenerating ribbons on the same cartridges of figures 7 to 10, even without eliminating any part, as the operation takes place equally, independently from the type of ribbon.

Of course many changes to the various typewriters, as well as the proper typewriter, can be adapted to the before described cartridges without going out from the scope of the said invention.

Claims

1. A removable cartridge for inked ribbon of typewriters or the like and relative typewriter, caracterized in that it comprises a casing containing the unwinding and winding ribbon spools and having a ribbon carrier swinging arm, which arm carries the same ribbon up to the type operation position, said ribbon onto said arm being superimposed on itself with a parallel forward and backward travel and the said spools being disposed into the casing in a coaxial position, superimposed or juxtaposed on approached parallel axes, said spools being operated with a movement step by step at each type operation in order to displace the already emploied section and to present a new ribbon section, said movement being caused by a hook lever acting on a toothing of the spool, and in its turn controlled by the typewriter universal bar, in order to unwind and wind at the same time a ribbon section, said control being also apt to raise the said swinging arm in order to carry the ribbon inked section free from guides, in front of the type operating point, so that the operation takes place on said new ribbon inked section and successively to lower again said swinging arm in order to let the already operated typing visible, the relative typewriter being caracterized by means accomodating and stopping the cartridge, said means being raisable together with the raising of the paper carrier roller for the capital letters and means for the control of the ribbon advancement combined with the universal bar of the typewriter.

2. A cartridge as claimed in claim 1, caracterized in that said casing containing the said spools and the corresponding movement means is associated with the typewriter covering a side position relative to the type operating point.

3. A cartridge as claimed in claim 1, caracterized in that said winding spools present a crown gear at the edge of one of the spool disk.

4. A cartridge as claimed in the preceding claims, caracterized in that said hook shaped lever operating the ribbon winding spool is associated with a three-arm lever, one of the said arm, being projectable from the casing, is moved by means connected to the universal bar, a second arm is inserted in a shaped recess or the like of said ribbon carrier arm and provides for raising and lowering the said ribbon carrier arm and the third arm provides for the movement of the said spool operating hook.

5. A cartridge as claimed in the preceding claims, caracterized in that everyone of the two spools can be reciprocably operated by said hook to accomplish the ribbon winding inverting the movement direction to the end to employ again the same ribbon.

6. A cartridge as claimed in the preceding claims, caracterized in that each winding spool is subject to a non-return resilient strip acting on the same advancing toothing.

7. A cartridge as claimed in the preceding claims, caracterized in that the unwinding spool or both the spools, in case of ribbon movement inversion, are provided with a brake acting on the spool or the ribbon to maintain in tension the ribbon during the advancement.

8. A cartridge as claimed in the preceding claims, caracterized in that, in case of ribbon movement inversion, the said advancing, stopping and braking controls are repeated for each spool and operated alternatively for the spool which is winding.

9. A cartridge as claimed in claim 8, caracterized in that the said advancing and stopping means are inverted under the action of a cam having a bistable position, provided with a snap spring, either position being determined by two followers alternatively in contact with the spool winding ribbon.

10. A cartridge as claimed in claim 8, caracterized in that the said advancing and stopping means, in case of parallel and juxtaposed spools, are inverted under the action of two cams disposed coaxially to each spool and acting separately on said traction hooks and non-return strips.

11. A typewriter as claimed in claim 1 apt to be associated with the cartridge, according to the preceding claims, caracterized in that said means accomodating and stopping the cartridge are constituted by a swinging

guide connected to the paper carrier carriage and provided with a cartridge stopping hook controllable by an outer button, said guide being raised together with the carriage under the control of the capital letter key.

12. A typewriter as claimed in claims 1 and 11 caracterized in that said means for controlling the ribbon advancement associated with the typewriter universal bar are constituted by a swinging blade or the like, said blade being pivoted on the typewriter base, and controlled by tension rods connected with the universal bar and acting on said arm projecting from the cartridge and rigidly mounted on the ribbon advancing lever.

13. A typewriter and a ribbon carrier cartridge provided with a self-movement, said cartridge being interchangeable and insertable in a side of the typewriter substantially as described and shown for the above specified purposes.

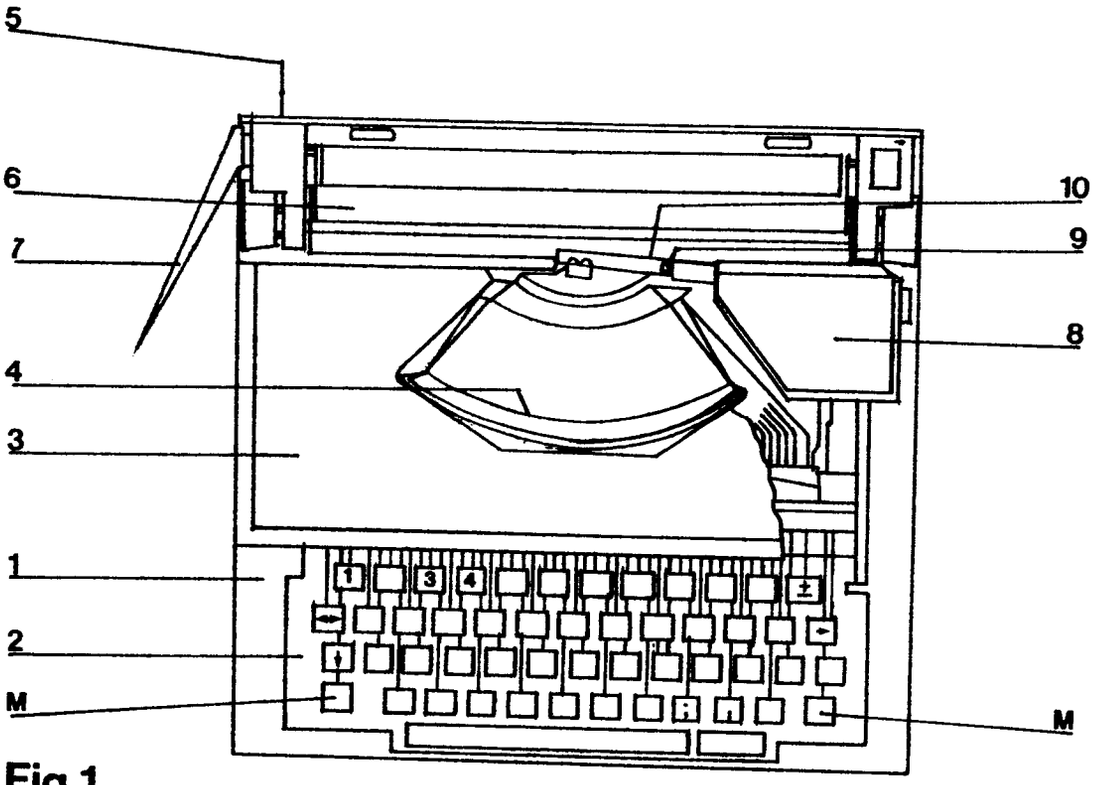


Fig.1

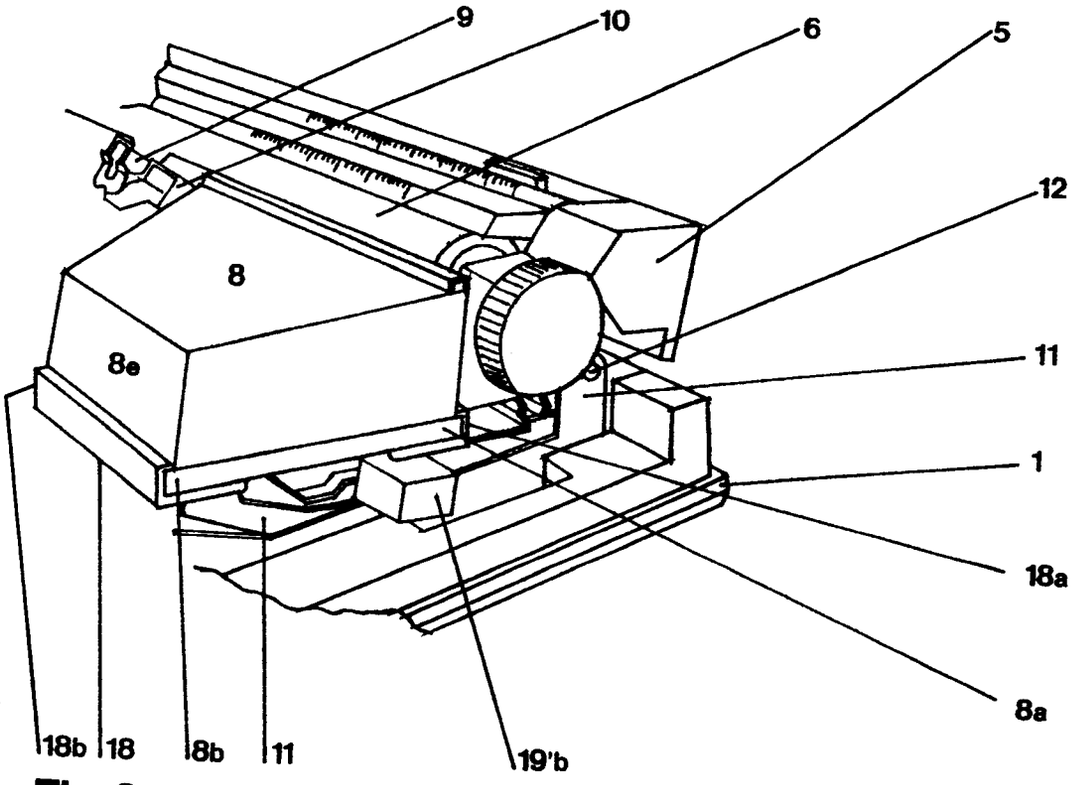


Fig. 2

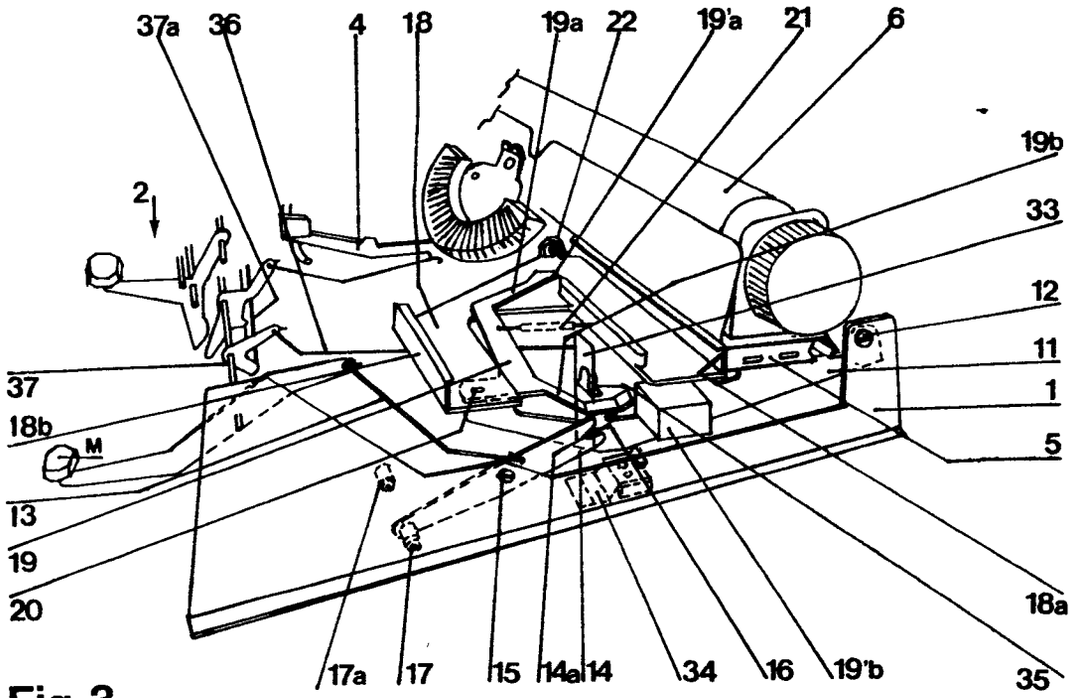

37a
36
4
18
19a
22
19'a
21
6
19b
2
33
12
11
37
1
18b
M
5
13
19
20
18a
17a
17
15
14a
14
34
16
19'b
35

Fig.3

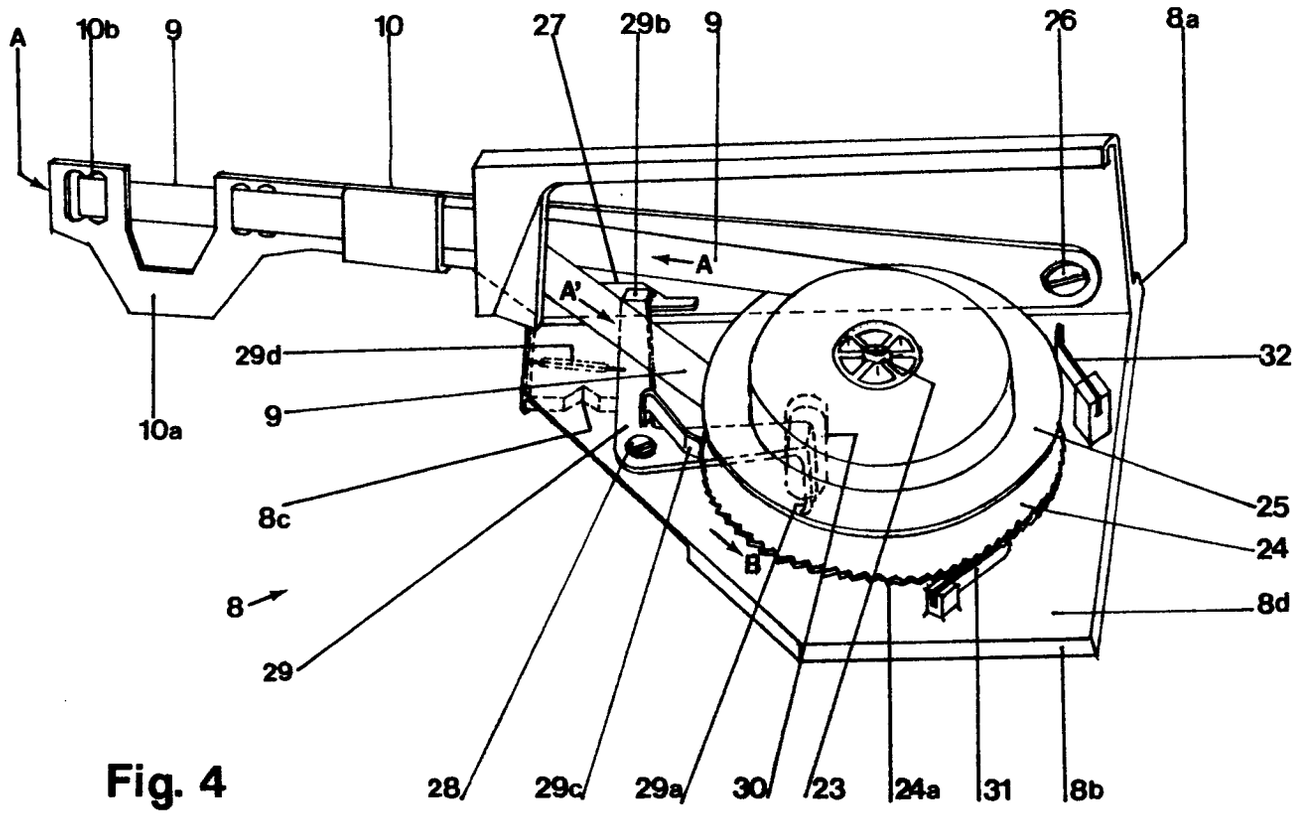

A
10b
9
10
27
29b
9
26
8a
A
A'
29d
32
9
10a
8c
25
24
B
8
8d
29
28
29c
29a
30
23
24a
31
8b

Fig. 4

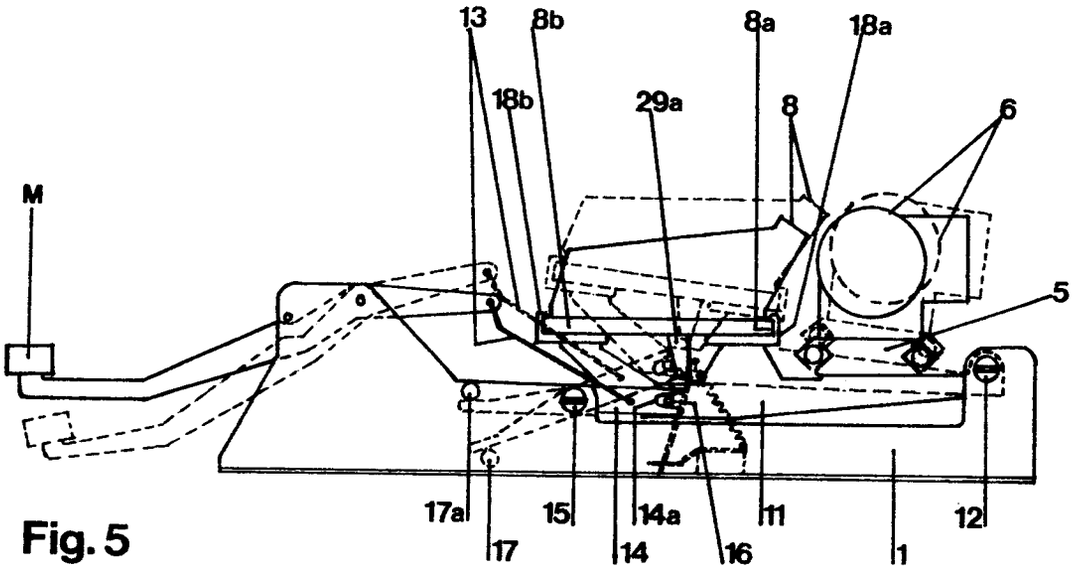

13
8b
8a
18a
18b
29a
8
6
M
5
17a
15
14a
11
12
17
14
16
1

Fig. 5

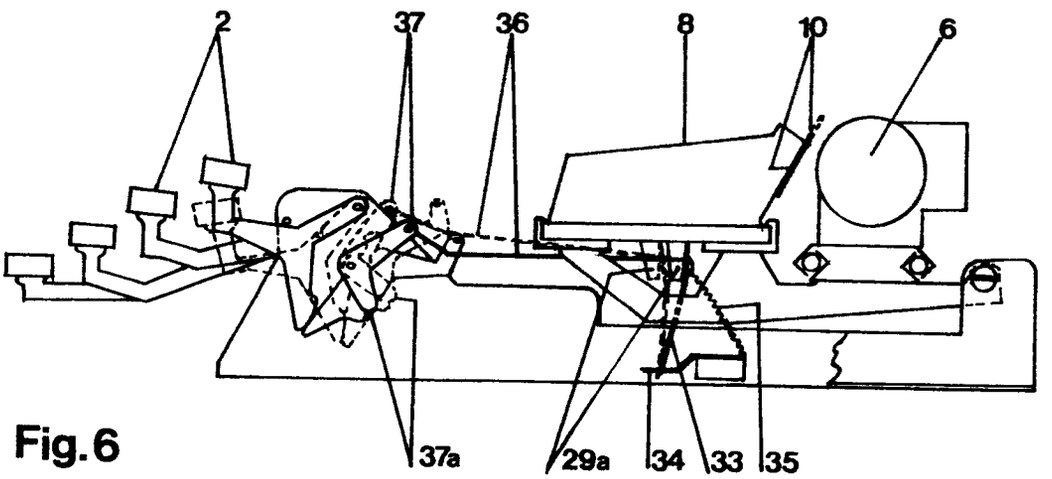

2
37
36
8
10
6
37a
29a
34
33
35

Fig. 6

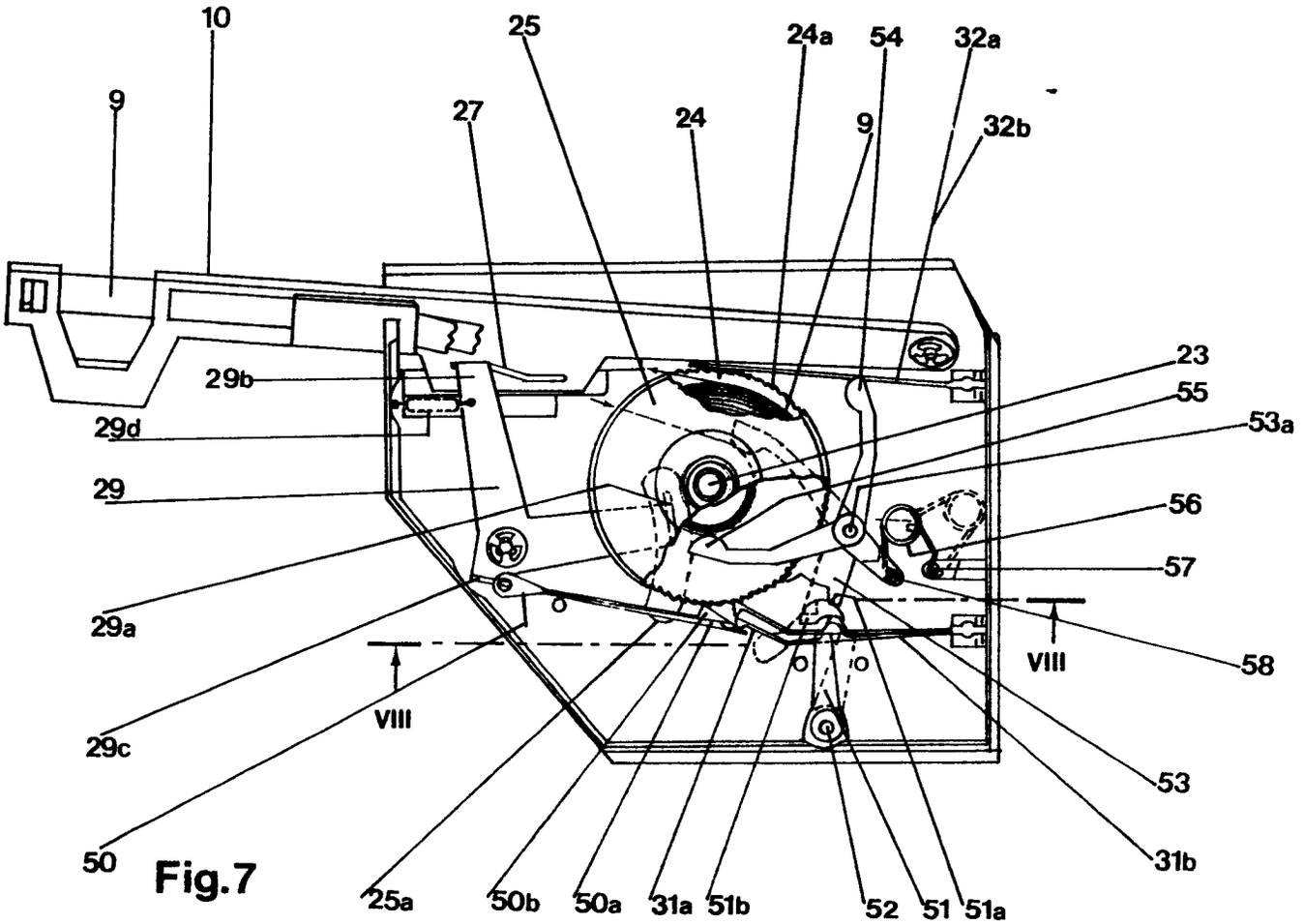

10
25
24a
54
32a
9
27
24
9
32b
29b
23
55
29d
53a
29
56
57
29a
VIII
VIII
58
29c
53
50
31b
25a
50b
50a
31a
51b
52
51
51a

Fig.7

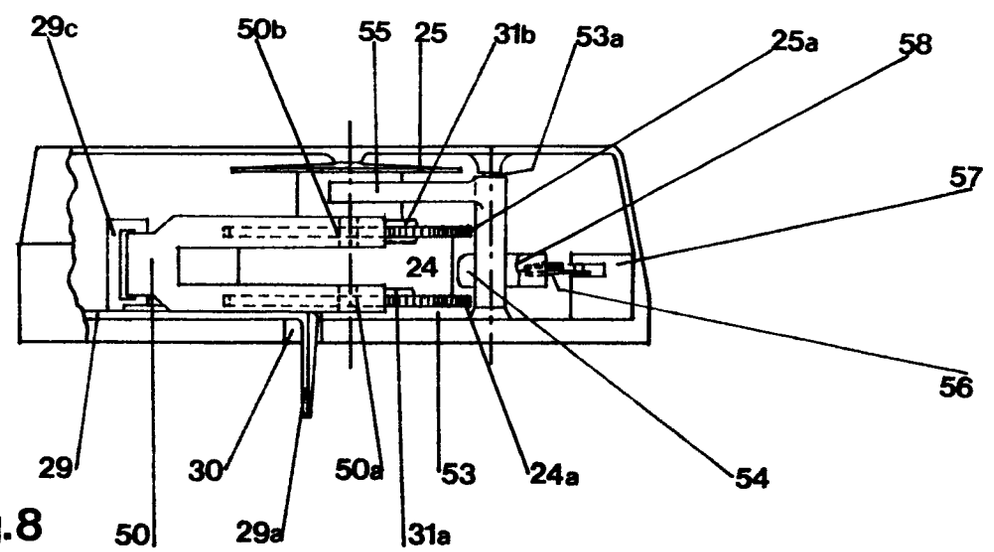

29c
50b
55
25
31b
53a
25a
58
57
24
56
29
30
50a
53
24a
54
50
29a
31a

Fig.8

0008279

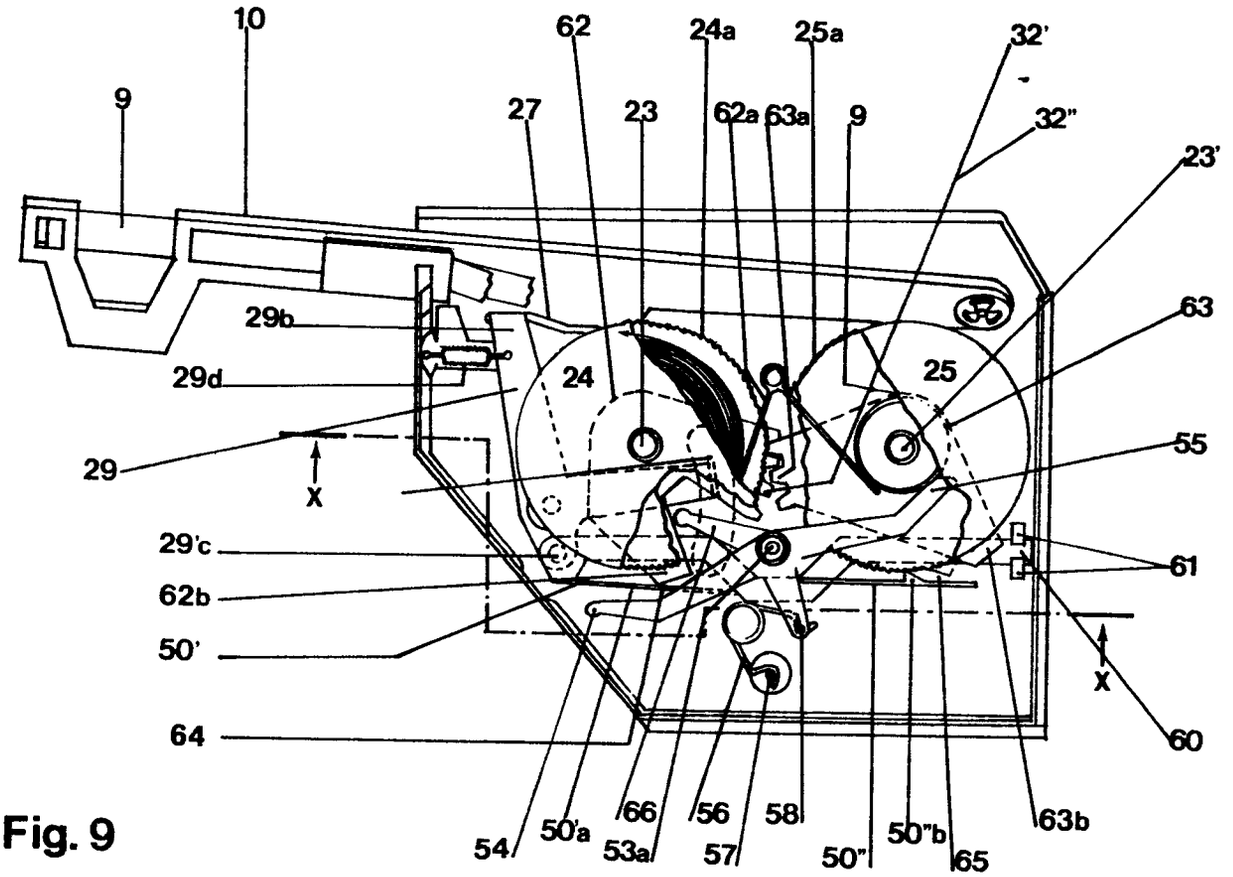


Fig. 9

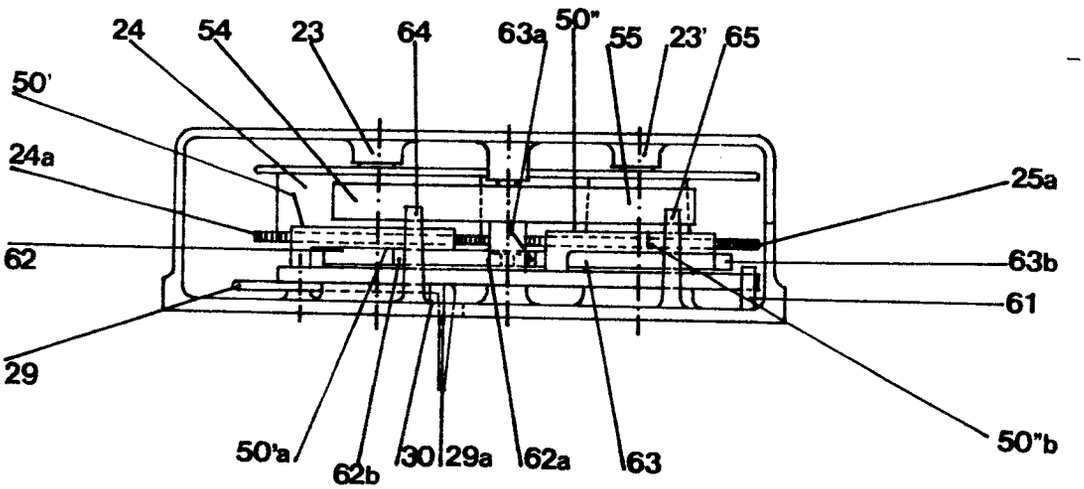


Fig. 10