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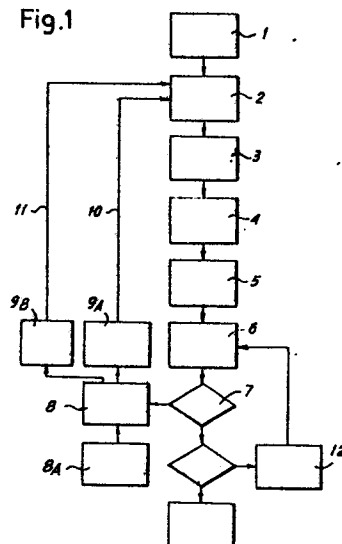
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(54) **System for correcting the geometry of the image resulting from the assembling of the deflection yoke on a cathode rays kinescope.**

(57) For the correction of the geometry and the distortions of the image obtained by a deflection yoke when associated with a kinescope to be steadily assembled to a yoke or to a reference kinescope, the following steps are provided: (1) generating a signal for the reference image, by a programmable signal generator; (2) displaying a distorted image on the kinescope/yoke under test; (3) reading the image through a solid-state television camera; (4) converting the analogic signal of the telecamera into a digital signal to make it utilisable by the processor; (5) storing the signal in a RAM type memory to keep it available during the processing; (6) processing and comparison in real time of the data relative to the distorted image with a reference or sample image on the basis of comparison-algorithms specifically studied for the various parameters coming from (12); (7) comparing the data with the tolerances; going on with the correction if necessary, otherwise performing the next step to begin the correction of another type of distortion; (8) calculating the correction necessary for that parameter through the proper correcting algorithm supplied by 8A; (9) performing the correction which must reduce the distortion of the displayed image, automatically obtained at (9A) (through the path 10) on (2), or by a guidance for the operator obtained at (9B) for a manual introduction according to (11).

Fig.1



## Description

In theory, the kinescope and the relevant deflection yoke, when properly designed the one relative to the other and manufactured with absolute accuracy, should give rise to an image lacking in deformations. In practice, the unavoidable technological restraints of the design and the construction tolerances allowed in the production of the kinescopes and the yokes are the cause of a variously deformed image. When such deformations, both systematic and fortuitous, fall within the normal limits, they can and must be corrected through changes of the magnetic field produced by the yoke, in order to obtain an image without distortions that are perceptible by the operator in relation to the application devised for that specific kinescope.

Assuming a system of coordinate axes is taken as a reference on the tangent plane at the center of the screen, and orthogonally projecting onto such plane the displayed image, the geometry distortions that can be observed are usually the following ones: off-center position; the image rotation; its imperfect geometrical similarity in respect to the reference image; thereby the linear surface and angular proportions are not perfectly reproduced.

At present, the above mentioned changes are made to the magnetic field produced by the yoke with successive attempts through a manual procedure based on the application of suitable permanent small magnets at suitable locations around the yoke, so as to obtain the compensation of the detected distortions.

In particular, there are currently used: on one side, two annular magnets which, by acting on the electronic beam before the deflection point, allow a global centering - by rotation - of the image; and on the other, a number "n" of small magnets (dipoles) - usually up to eight - able to be positioned to form a crown around the yoke and to be oriented each on its own axis - which small magnets, by acting after the deflection point on the electronic beam allow an almost selective correction of the edge distortions of the images in the respective corresponding zones.

The above mentioned manually-operated correction procedure is lengthy and expensive, firstly because the correcting magnets interact to a certain degree, thereby a correction in a given zone may unbalance the previously effected correction(s), thus requiring a reiterate procedure by successive approximations; besides, only limited types of deformations can be corrected through simple and repeatable procedures; again, there are cases in which the tolerances of the kinescope and the yoke sum up together giving rise to deformations that are practically impossible to correct by a manual procedure. Moreover, the resulted quality is in any case dependent on the detection and execution skill of the human operator.

The object of the invention is to provide a system which allows the correction of the distortions produced by a kinescope/yoke system, through the automatic or semi-automatic magnetization of neu-

tral magnetic elements pre-mounted on the yoke or on the kinescope. In the semi-automatic version, this equipment may function as a guide to the operator who performs the corrections in a traditional way by providing and adjusting the small magnets.

In particular, the invention provides, in the automatic version:

1) - The automatic detection of the type(s) of deformation produced by the casual coupling of a yoke with a kinescope, and decision on the correction possibility.

2) - The automatic correction of the detected deformation(s), through a selective magnetization concerning areas of fixed magnetizable elements pre-assembled on the yoke and disposed before and after the deflection point of the electronic beam; or, in case of a semi-automatic cycle, the guidance to the operator through the information supply about the corrections to be operated, thereby facilitating the operator's intervention.

3) - The verification of the correction carried out in relation to defined and constant tolerances.

Subordinately to the totally automated function and thus with a partial utilization, the invention can provide - in the above mentioned semi-automatic version - an operator's guidance, which implies to leave the phases of points 1 and 3 unchanged, while the operator performs, by hand, the correction according to point 2, through the guided disposition of the traditional small magnets on the yoke lacking in the pre-mounted magnetizable elements.

It is therefore a first object of the invention to provide a procedure for the correction of the geometry and distortions of the image obtained from a deflection yoke to be corrected, when this is associated with a kinescope to be steadily assembled to the yoke or to a reference kinescope, characterized in that it comprises: the digital acquisition of the images obtained from the kinescope associated to the yoke; the processing of the acquired data to get information for the individual corrections; the execution of the corrections of the magnetic field of the yoke; and the verification of the corrections that have been carried out.

The corrections may be carried out through guiding information supplied to the operator for the corrections to be imposed on the magnetic field of the yoke. Said corrections can be carried out by traditional small magnets mounted almost radially together with small flux-spreading magnets.

As an alternative to the manual correction, electrical correction pulses may be generated - through the processing - able to generate a plurality of magnetic poles on magnetizable bodies prearranged around the yoke before and after the deflection point of the kinescope electronic beam on the yoke or on the kinescope.

The magnetic fields are simultaneously generated in all the positions distributed around the yoke, or

alternatively, in sequence.

Practically, the procedure may comprise the steps of:

- referring and retaining the kinescope and yoke on positioning means;
- demagnetizing an anti-implosion band of the kinescope;
- switching on and piloting the kinescope and yoke, with the production of the image to be corrected;
- acquiring said image by a television camera and digitizing it;
- processing said image through suitable algorithms in order to define the distortions thereof at the checking points, in respect to the reference image;
- detecting, at such checking points, the possible deformations which can be corrected by a rotation of the yoke;
- as a consequence, a possible yoke rotation by a suitable mechanical unit;
- detecting the remaining distortions that can be corrected by adding permanent magnetic fields on the yoke, in automatic way through the local and selective magnetization of pre-mounted plastroferrite elements, or alternatively, by manual operation through the positioning of suitable small magnets on the yoke or by other corrections;
- checking the result of the corrections and recycling it for successive approximations;
- ending the operation and delivering a message to the operator and/or to the possible robot-operated loading/unloading system of the machine.

Advantageously, the sum of the internal magnetic polarizations on a magnetizable element is zero.

Another object of the invention is to provide an apparatus for the correction of the geometry and distortions of the image taking place upon the assembling of a deflection yoke to a kinescope, by means of the above described procedure. Substantially, said apparatus comprises: means for the acquisition and digital processing of the image; and means for the correction of the magnetic field of the yoke through a magnetizing head, with magnetizable elements pre-mounted on the yoke or the kinescope.

The apparatus may further comprise: a process control computer, with peripheral and input/output data units; an electric power supply; means for the generation of video signals; a television camera for the image acquisition; centering means; and possibly robot-operated means for loading/unloading the kinescope and deflection yoke group or unit or the yoke alone on/from the machine.

In a simplified embodiment for manual interventions, the apparatus comprises a monitor to supply the operator with data for the manual correction of the distortions.

In an automated embodiment, the apparatus comprises a correction head that can be moved close to and away from the kinescope/yoke group being placed on a seat, which head comprises in turn: homokinetic (Holdam) joint-operated centering means; means for the angular centering and engagement of the yoke; motorized means for determining angular displacements of the yoke; radial slides carrying respective magnetization coils; mo-

torized means for radially controlling the approach and withdrawal of said slides and coils in respect to magnetizable masses of the yoke; and centering means. Said head may also comprise screwing means for the blocking of the yoke to the kinescope.

More particularly, the apparatus may comprise: a table with at least two kinescope-engaging groups; at least two stations, one of which being provided with said correction head and another station being provided with controlling means for centering and blocking the kinescope (replaceable upon each cycle or kept as a reference kinescope) and presenting the yoke alone or together with the kinescope. Possibly robot-operated assembling and/or disassembling means may be provided in said other station.

The apparatus may be suitably modified when magnetization elements are directly provided on the kinescope. In this case the apparatus may comprise means for the positioning of at least one ring being magnetizable directly on the kinescope.

A further object of the invention is to provide a deflection unit for carrying out the above procedure and/or by means of the above apparatus. Said unit is characterized by one or more portions of a magnetizable material around the kinescope at suitable positions in respect to the deflection point.

Practically, said unit may comprise two magnetizable annular elements engaged to the yoke or to the kinescope at positions located respectively before and past the deflection point, and apt to be locally and steadily magnetized in discrete areas; said annular elements are made of plastroferrite.

The invention will be better understood by following the description and the attached drawing which shows a practical non limitative exemplification of the same invention. In the drawing:

Fig. 1 shows a logic block diagram of the correction procedure;

Figs. 2 and 3 show a logic block diagram and a physical block diagram of the apparatus;

Figs. 4, 5 and 6 show views in schematic vertical sections and an ensemble plan view;

Figs. 7 to 15 show construction details of an operating head for the operations on the kinescope;

Fig. 16 shows a schematic view of the yoke. The logic block diagram of Fig. 1 summarizes a description of the logic steps of the correction procedure, that are the following ones:

= 1) generating a signal for the reference image, by a programmable signal generator;

= 2) displaying a distorted image on the kinescope/yoke under test;

= 3) reading the image through a solid-state television camera;

= 4) digitizing, that is, converting the analogic signal of the telecamera into a digital signal to make it utilizable by the processor;

= 5) storing the signal in a RAM type memory to keep it available during the processing;

= 6) processing and comparison: the data relative to the distorted image are processed in real time and compared at the checking points

with a reference or sample image on the basis of comparison-algorithms specifically studied for the various parameters coming from 12 (comparing algorithm);

= 7) comparing the data with the tolerances: going on with the correction if necessary, otherwise performing the next step to begin the correction of another type of distortion;

= 8) calculating the correction necessary for that parameter through the proper correcting algorithm supplied by 8A;

= 9) performing the correction which must reduce the distortion of the displayed image, automatically obtained at 9A (through the path 10) on 2, or by a guidance for the operator obtained at 9B for a manual introduction according to 11.

To carry out the corrections, an operating head is used capable of changing the position of the yoke and magnetizing, areas after areas, two initially neutral magnetic elements - made of plastoferite - located before and after the deflection. When a type of correction has been performed, the ring is run again until the residual distortion falls within the tolerance. At this point, the ring is abandoned to pass to correct another parameter. For example, the operations may include first, off-centering; then rotation; and finally edge distortions until the complete setting up within the tolerances is completed.

In the logic block diagram of Fig. 2 numeral 31 indicates an operating and magnetizing head to be described in details later; numeral 33 indicates the yoke and 35 the kinescope under examination; numeral 37 indicates a television camera for the detection of the image generated on the kinescope; numeral 39 indicates the operator's guide service monitor; numeral 41 indicates the unit of the process control computer where the various blocks have the following functions: 41A acquisition of the image produced by the television camera 37; 41B comparison; 41C determination of the distortions; 41D determination of the corrections; 41F generation of the correction control for 31; 41E generation of the reference image, for 33 and 35; 41G guidance messages for the operator, to be delivered to the service monitor 39.

In the physical block diagram of Fig. 3, numeral 51 indicates the process control computer including memories, processors, disks, input and output units, software and other. To this process control computer the following facilities are associated: the television camera 52 for the acquisition of the image from the kinescope and the electromechanical group 53 made up of: the group 53A for the magnetization of the correcting elements (made of plastoferite or the like); the group 53B for the correction of the yoke position; the group 53C for the piloting of the kinescope/yoke; the mechanical group 53D for the positioning of the kinescope/yoke; a demagnetizer group 53E; and finally, a possible mechanical group 54 for the robot-operated loading and unloading of the pieces.

The apparatus described below, by way of example, as an application of the invention, may be

modified to suit different types of tube and yoke.

Figs. 4, 5, 6 show, in the whole, a construction of a two-station apparatus, one station for the loading and unloading and the other for the adjustment and fixing of the yoke. Numeral 71 generally indicates the base structure, with an intermediate support plate 73 from which a central column stems; this column is surrounded by a table 77 mounted on bearings 79 and driven by a group 81 to be angularly displaced - with reciprocate and intermittent movements - so that each (or more) of the seats of the table itself can subsequently reach the position for the loading and unloading and that for the adjustment and blocking; it is not excluded that there may be loading and unloading stations, being separated especially for robot requirements. A pin centering group 83 ensures the positioning of the table 77 at the various stations, with the aid of seats 85 for the pin of group 83. As shown, in particular, in Fig. 6, the table 77 has, in this example, two replaceable - according to the type of tube - tray like seats for the kinescopes C1 and C2; the kinescope C1 is in the loading and unloading position and the kinescope C2 is in the adjustment and blocking position. In each of the two seats, invitation profiles 87 are provided to ease the positioning of the kinescope between fixed supports and thrust means, against the supports, and two clamps 89, driven by systems 89A, for the clamping of the kinescope in the seat and for its withdrawal therefrom upon the replacement of an assembled group with a kinescope to be assembled to a yoke at the position C1; at the position C2, the clamps 85 remain operative.

On the fixed central column 75, a castle 90 is placed carrying in correspondence of the position C1 an operating group 92 able to push the yoke presented thereto against the conicity of the kinescope into position C1, and able to angularly orient it therein. The operating group 92 has therefore a vertically movable equipment and a horizontally movable unit with a conical invitation to act on the tool for the yoke engagement. The kinescope and/or the yoke may be presented at position C1 and to the group 92 either manually or by robot-operated apparatuses that may be also used for the withdrawal of the assembled and blocked kinescope/yoke complex coming from the position C2; the withdrawal may also be operated by an equipment independent of that provided for presenting the yoke and/or the kinescope, on the same or in a different position. Presentation and/or withdrawal may be also manually operated.

In the position C2, the castle 90 exhibits a unit 94 intended for the adjustment and the blocking, which is better illustrated in Figs. 7 to 15. In correspondence of this position C2, below the rotating table 77 and the intermediate plate 73, a television camera 96 is located which corresponds to that indicated by 37 in the diagram of Fig. 2 and which is disposed with vertical axis and oriented towards the kinescope at position C2, in order to pick up the image that is formed thereon, for the suitable processings and corrections. Through a per se known disposition, a demagnetization ring 98 is provided just below the kinescope at position C2, which ring is timely run by

a sinusoidal current having a decreasing exponential flow, in order to demagnetize both the tube frame and other metal parts near the kinescope at position C2.

In the position C1, either a kinescope/yoke group or the coupling of a yoke on a previously fed kinescope or on a fixed reference kinescope may be provided. The group is transferred to the position C2 for the processing. The kinescope/yoke group is then moved to the position C1 from which it can be moved away and replaced with a new kinescope to be blocked at C1, and/or with a new yoke to be supported on the kinescope neck. At position C1 a brushing of the contacts may be also operated to revive the surface thereof.

The apparatus may also be realized for acting on the yokes that are fitted each time on a reference kinescope which is and remains thereby placed on each of the seats provided on the table 77. In this case, at position C1, only the controlled yoke is replaced with one to be still controlled, and at position C2, the blocking of the yoke on the kinescope is not operated. A distortions corrections may be even provided according to a pre-established program, and without the presence of a kinescope, with a part of the apparatus rendered useless.

In any case, a brushing of the contacts may be operated in order to ensure the connections.

The above mentioned operations refer to a yoke associated to a magnetizable ring. Such a ring or other magnetizable component may also be directly associated to the kinescope to be corrected.

The sum of the magnetizations of a plastroferrite ring (or other equivalent component) results equal to zero.

Figs. 7 to 15 illustrate in more details a specific embodiment of the group 94 summarily illustrated in Fig. 4; this group may be lifted and lowered relative to the kinescope at position C2, for example by a motorization system 100 (Fig. 4) including a threaded rod-coupling and with a guide stem, or by other suitable means. The lifting and lowering complex includes a support table 102, with the motors for the various adjustments therein. On said table 102, through bearings 104, a rotating equipment 106 is mounted which makes up the fixed part of a homokinetic joint (like a Holdam joint), whose mobile part 108 can thus be centered on the axis of the kinescope neck through a suitable seat 110 provided with contacts; the equipment 106 provides in any case for the desired angular displacements on the yoke to be adjusted into position. These angular displacements are imposed through a worm screw 112 tangentially placed in respect to a sector gear 114 formed by the equipment 106; said worm screw 112 is controlled by a motor 116 located on the support table 102; the angular movements imposed by the worm screw 112 are transferred from the homokinetic joint to the driven part 108 thereof, which is centered relative to the seat 110 on the kinescope and which engages the yoke. On the driven part 108, a core 118 is associated which forms, at a higher level, radial sliding seats for four slides 120 driven by a cam 112 developed as a ring

and movable around the body 118, said cam having four slots 122A just for the radial displacement of the slides 120. The angular control of the ring 122 of the cam is achieved through a sprocket wheel 124 operated, though an articulated transmission 126, by a motor 128 carried by the table 102. The ring 122 is solid with a further and underlying cam ring 130, which makes up a second cam through its twelve operating slots 130A which simultaneously drive as many further slides 132. The slides are mounted for radially sliding on the body 118 being solid with the driven part 108 of the homokinetic joint. Accordingly, the motor 128, through the transmission 126, 124 and the sector gear 122B, drives the two cam rings 122 and 130 and thus the simultaneous radial displacements of the four slides 120 and of the twelve slides 132.

The slides 120 carry magnetization coils 120A for a ring 302 of the yoke 300, particularly illustrated in Fig. 16; this magnetizable ring 302 is placed in correspondence of the kinescope neck on the narrow part of the yoke. The coils 120A receive suitable pulses being simultaneous but different among them owing to the processing carried out by the computer, and permanently magnetize the ring 302 in relation to the adjustment to be imposed.

The magnetization of the magnetic element placed before the deflection point ensures a pre-centering. In case such element is not mounted, direct - instead of pulsing - currents allow a centering during the alignment. Subsequently, the traditional centering means are mounted.

The twelve slides 132, which are radially driven by the slots 130A of the cam ring 130, carry each a magnetization coil 132A having its axis downwardly inclined, all the axes of the coils converging on the axis of the kinescope when centered. The magnetization coils 132A are able to act on a plastroferrite ring 304 mounted on the broader terminal part of the yoke 300 and forming an outer, truncated cone surface to which the ends of the coils 132A may be brought close for the local magnetization of the ring 304 in twelve points.

The yoke must be fastened in angular position to carry out the desired adjustments. To this end, a terminal ring 118A of the body 118 has a number of slot housings 136, apt to accomodate as many pegs 306 stemming from the lower part - having greater diameter - of the non magnetic frame of the yoke 300. Into the housings 136, contact elements 138 project, which are movable by inclined profiles 132B formed by the slides 132 (Fig. 14); these contact elements 138 are moved into the housings 136 upon the centripetal advancement of the slides 132 for the approaching movement of coils 132A to the magnetizable ring 304; in this way, by the approach of coils 132A, the angular stabilization of the yoke owing to the elements 138 acting on the appendixes 306 as well is determined. When the coils 132A have been brought near the ring 304, they give rise - by receiving simultaneous and metered electrical pulses - to suitable local magnetizations of the ring 304, in order to achieve the correction of the images.

The group 94 is also provided with a system for controlling of the presence of the yoke and its

correct position relative to the body 118, 118A and then determines the stop of the downward movement of the head. To this purpose, a stylus like the one indicated by 140 in Fig. 13 may be used, able to act, through an oscillating movement, on a mobile slider 142 of a proximity switch 144, to give a consensus according to the relative position between the yoke and the body 118.

The group 94 also comprises means for the blocking of the yoke on the kinescope neck, successively to the yoke adjustments. For the blocking, a clamping band system 310 may be provided, with a tangential clamping screw 312. To this end, on the table 102, a motor 150 is provided which, through a transmission 152, 154, 156, drives a screwing tool 158 able to act on the screw 312. The transmission allows a translation according to the double arrow f160 of an equipment 160, carrying said tool 158 and being controllable through a fluid-operated system 162. By this disposition, at the end of the yoke operations, the tool 158 is moved forwards and engages by its rotation the screw 312, in this way clamping the band 310 of the yoke on the kinescope neck for a firm, relative blocking. The screwing tool 158 may also be predisposed to act on hexagonal head screw or other type-head screws.

Numeral 164 indicates elastic plate contacts intended to establish the temporary electrical connections with the yoke.

The group or unit 94 further comprises a group 166 (Fig. 4) intended to establish the contact with the kinescope upon the lowering of the group 94 on the kinescope at position C2, for the acceleration tension.

The programming ensures the various movements for carrying out the operation and the reverse movements for the successive return. The picking up of the signals and data, the processing of data and the delivery of the signals are timely ensured to carry out the desired operations.

Obviously, the execution implying the semi-automatic corrections (and thus the manual intervention) results simpler than that described with reference to the drawing.

It is understood that the drawing shows an exemplification given only as a practical demonstration of the invention as this may vary in the forms and dispositions without nevertheless departing from the scope of the idea on which the same invention is based. For example, it is possible to combine a magnetizable component with the kinescope rather than with the yoke.

## Claims

1) A procedure for correcting the geometry and distortions of the image obtained through a deflection yoke to be corrected, when this is associated to a kinescope to be steadily assembled to the yoke or to a reference kinescope, characterized in that it comprises: the digital acquisition of the images obtained by the kinescope associated to the yoke; the

processing of the acquired data to get information for the individual corrections; the execution of the corrections of the magnetic field of the yoke; and the checking of the corrections that has been carried out.

2) Procedure according to claim 1, characterized in that the corrections are carried out through guiding information supplied to the operator for the corrections to be imposed on the magnetic field of the yoke.

3) Procedure according to claim 2, characterized in that the corrections are carried out through the traditional small magnets mounted radially on the yoke, and/or through flux-spreading small magnets.

4) Procedure according to claim 1, characterized in that in order to carry out the corrections, electrical pulses are generated by processing, said pulses being able to produce a number of magnetic poles on magnetizable bodies predisposed around the yoke before and after the deflection point of the electronic beam of the kinescope, on the yoke or on the kinescope.

5) Procedure according to claim 4, characterized in that in one case, the magnetic fields are simultaneously generated in all the positions distributed around the yoke or, alternatively, in sequence.

6) Procedure according to the preceding claims characterized in that it comprises the steps of:

- referring and retaining the kinescope and yoke of positioning means;
- demagnetizing an anti-implosion band of the kinescope;
- switching on and piloting the kinescope and the yoke, with production of the image to be corrected;
- acquiring said image through a television camera and digitizing it;
- processing said image through suitable algorithms in order to define the distortions thereof at the checking points, in respect to the reference image;
- detecting the possible deformations at such checking points; deformations which can be corrected through a rotation of the yoke;
- as a consequence, possible yoke rotation through a suitable mechanical group;
- detecting the remaining distortions that can be corrected either automatically by adding permanent magnetic fields on the yoke through a local and selective magnetization of pre-mounted plastoferrite elements, or alternatively, by manually positioning suitable small magnets on the yoke or by other corrections;
- checking the correction result and performing new cycles for successive approximations;
- ending the operation and delivering a message to the operator and/or to the possible robot-operated loading/unloading system of the machine.

7) An apparatus for the correction of the geometry and distortions of the image upon the association of a deflection yoke (33-300) to a

kinescope (35), by the procedure of one or more of the preceding claims, characterized in that it comprises: means (37,41) for the acquisition and the digital treatment of the images; and means for correcting the magnetic field of the yoke by a magnetizing head (31) with magnetizable elements (302,304) pre-mounted on the yoke or on the kinescope.

8) Apparatus according to claim 7, characterized in that it further comprises: a process control computer (51), with peripheral and data input/output units; a power supply means for generating video signals; a television camera (52-96) for the image acquisition; centering means (53); and possibly robot-operated mechanisms (54) for loading and unloading the kinescope and deflection yoke group or only the deflection yoke to and from the machine.

9) Apparatus according to claims 7 and 8, characterized in that it comprises a monitor (39) to supply the operator with data for the manual correction of the distortions.

10) Apparatus according to claims 7 and 8, characterized in that it includes a correction head (94) movable close to or away from the kinescope and yoke group being placed on a seat, said head including in turn: homokinetic (Holdam) joint centering means (106,108); means (110) for the angular centering and the engagement of the yoke (300); motorized means 112,116 for imposing angular displacements to the yoke; radial slides (120,132) carrying respective magnetization coils 120A,132A); motorized means (130,132; 122B; 124; 126; 128) for radially controlling the approach and withdrawal of said slides and the coils in respect to magnetizable masses (302,304) of the yoke (300); and centering means (136,306).

11) Apparatus according to claim 10, characterized in that it comprises screwing means for the blocking of the yoke to the kinescope.

12) Apparatus according to claim 10, characterized in that it comprises: a table (77) with at least two groups for the engagement of the kinescope; at least two stations, one of which being provided with said correction head (94) and another station being provided with means for the control of the centering and blocking of the kinescope (being replaceable upon every cycle or maintained as a reference kinescope) and for presenting the yoke.

13) Apparatus according to claim 12, characterized in that it comprises possibly robot-operated mounting and/or dismounting means in said other station for the yoke and a possible kinescope.

14) Apparatus according to claim 7, characterized in that it comprises means for the placing of at least a ring directly magnetizable on the kinescope.

15) A deflection unit for carrying out the procedure of the claim 1 and /or with the apparatus of at least one of the claims 7 to 14, characterized in that it comprises one or more

portions of magnetizable material around the kinescope at suitable positions relative to the deflection point.

16) Deflection unit according to claim 15, characterized in that it comprises two annular magnetizable elements (302,304), engaged to the yoke (300) or to the kinescope at positions respectively before and after the deflection point, and able to be locally and stably magnetized in discrete areas.

17) Deflection unit according to claim 15, characterized in that said annular elements are made of plastroferrite.

Fig.1

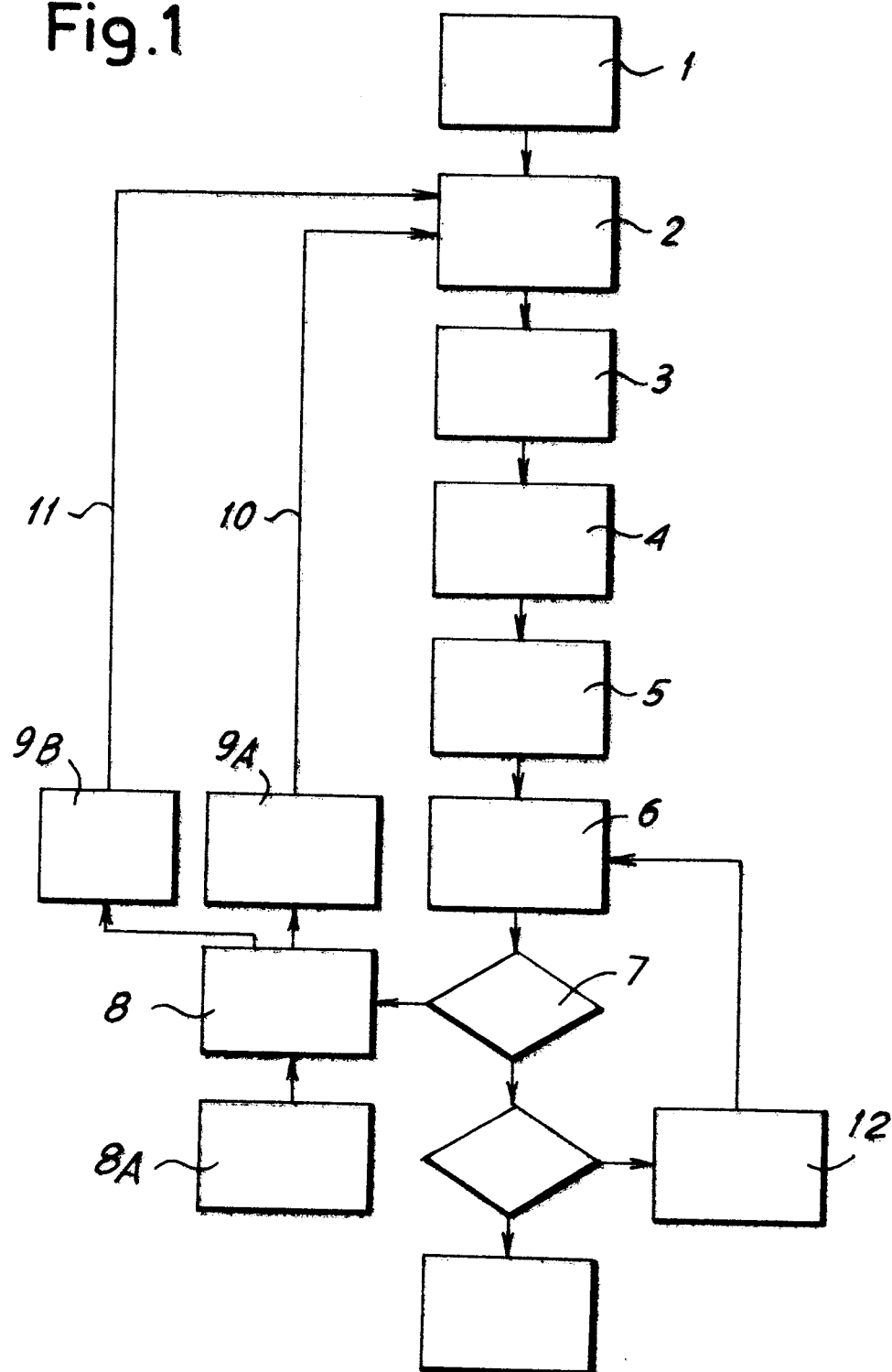




Fig. 2

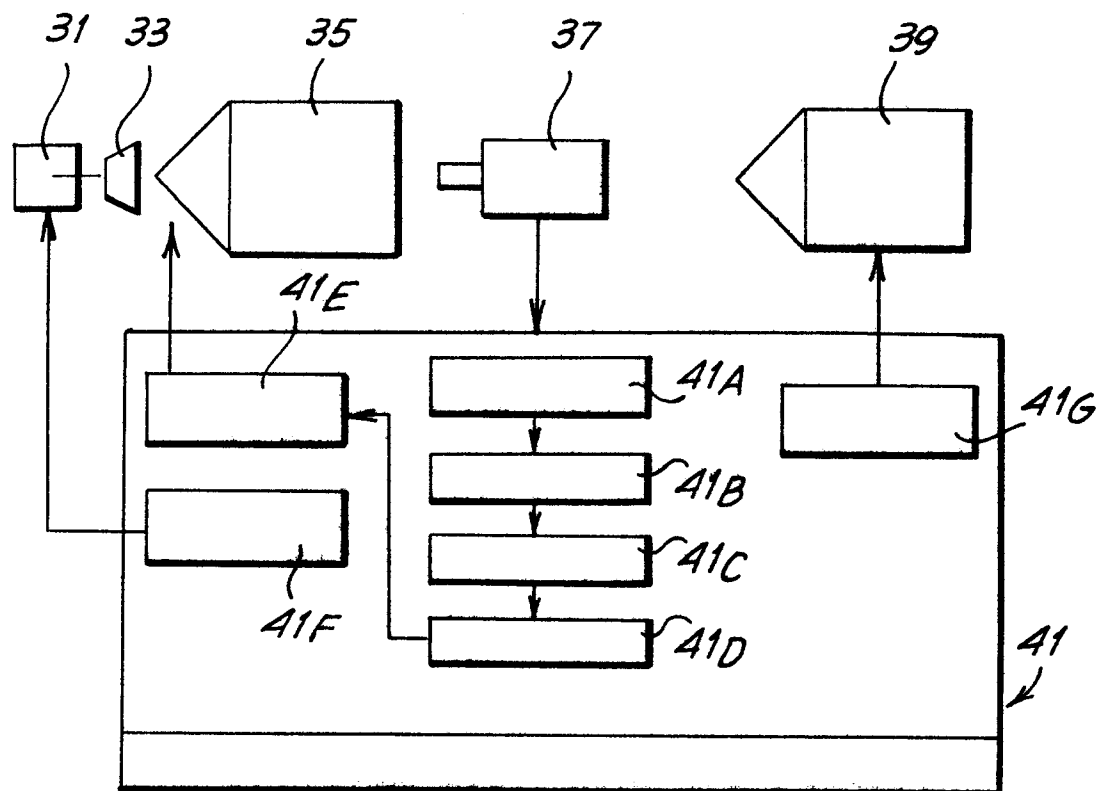


Fig. 3

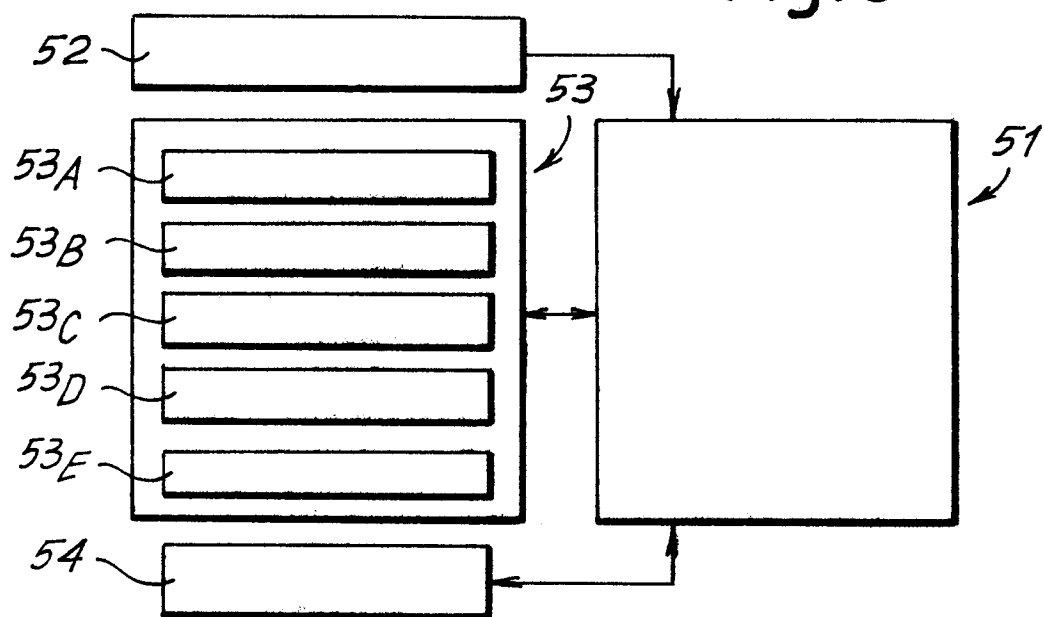


Fig. 4

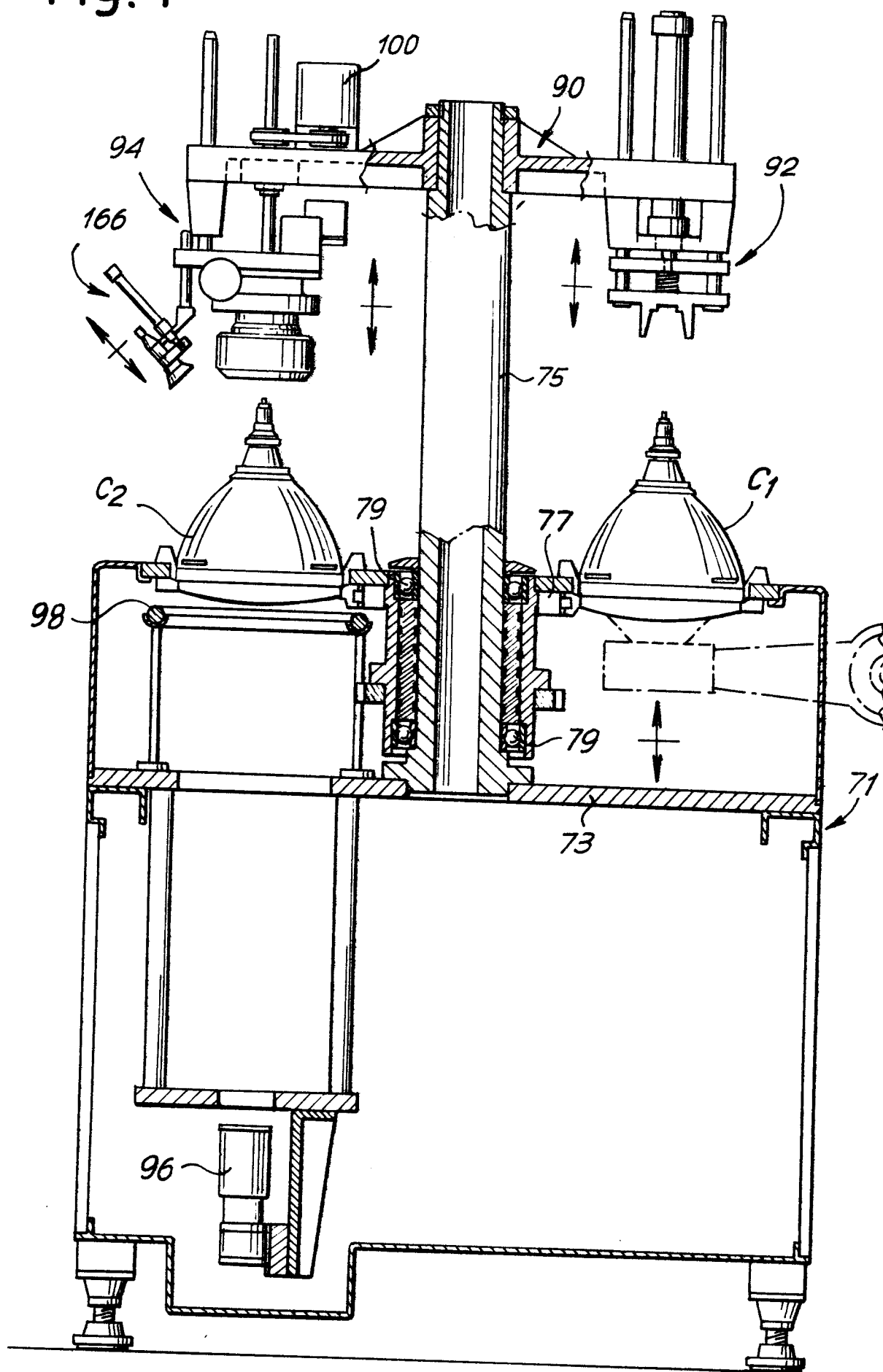


Fig.5

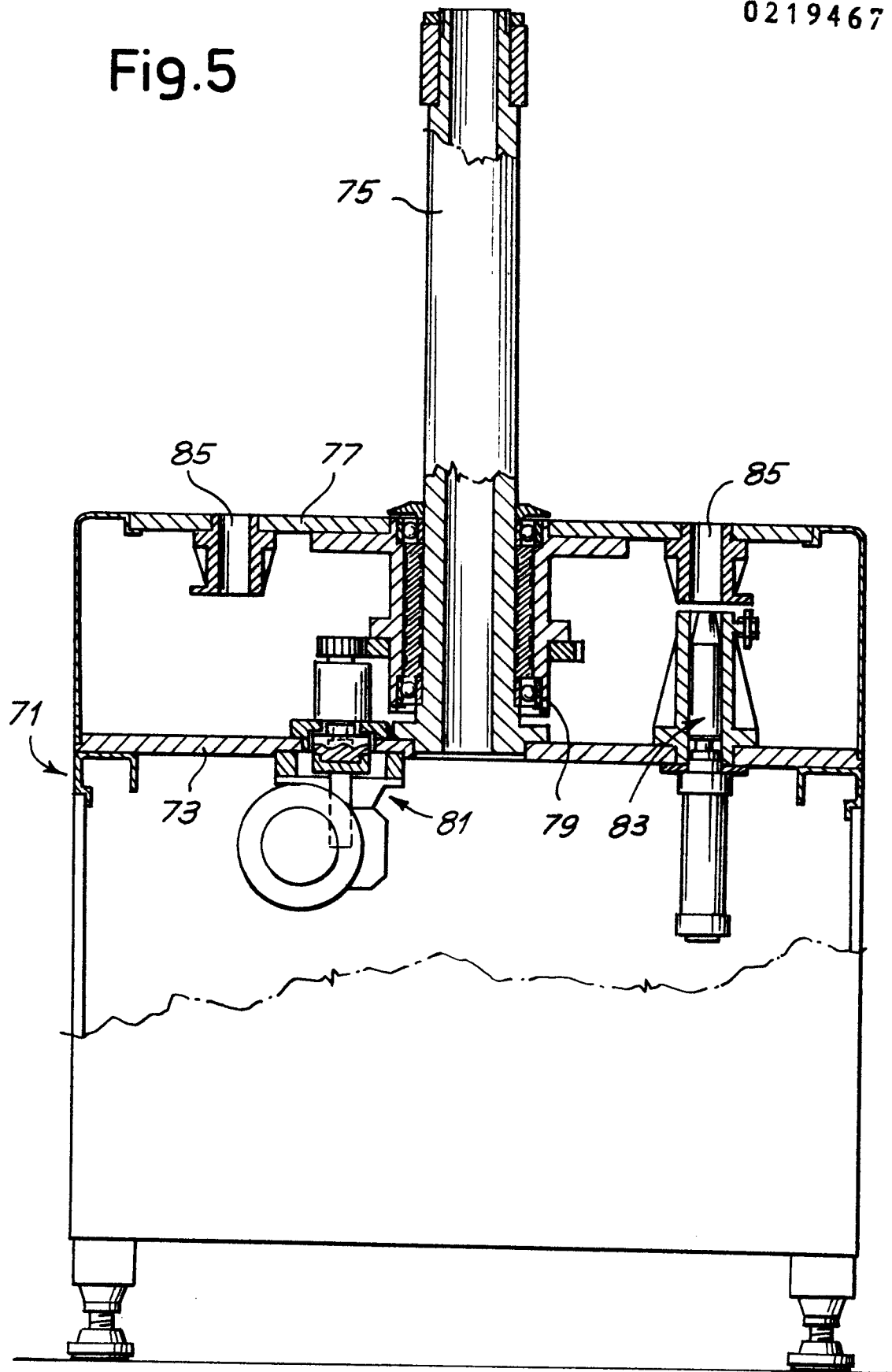




Fig. 7

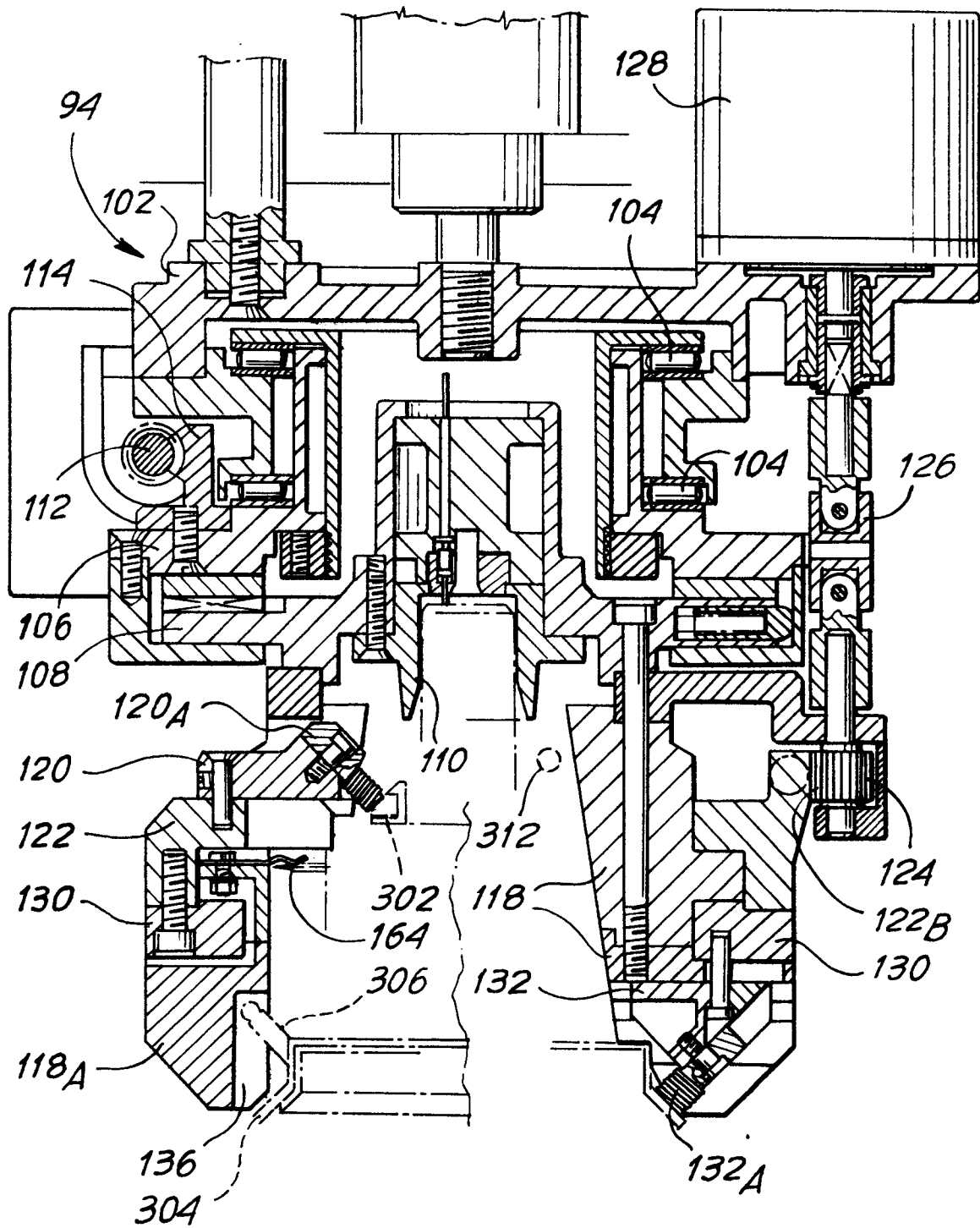


Fig. 8

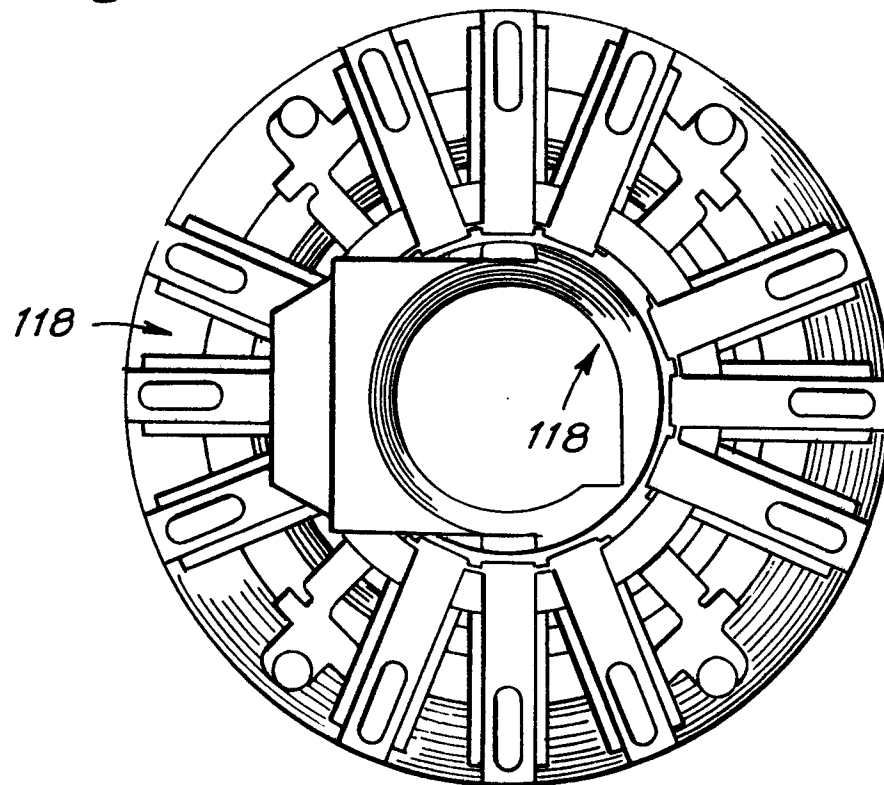


Fig. 9

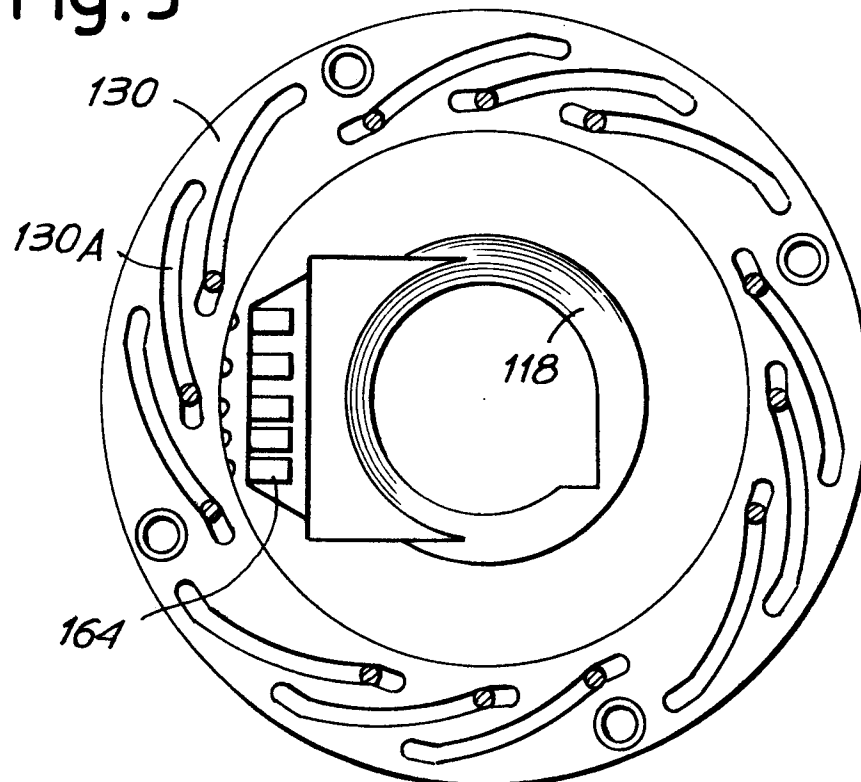


Fig.10

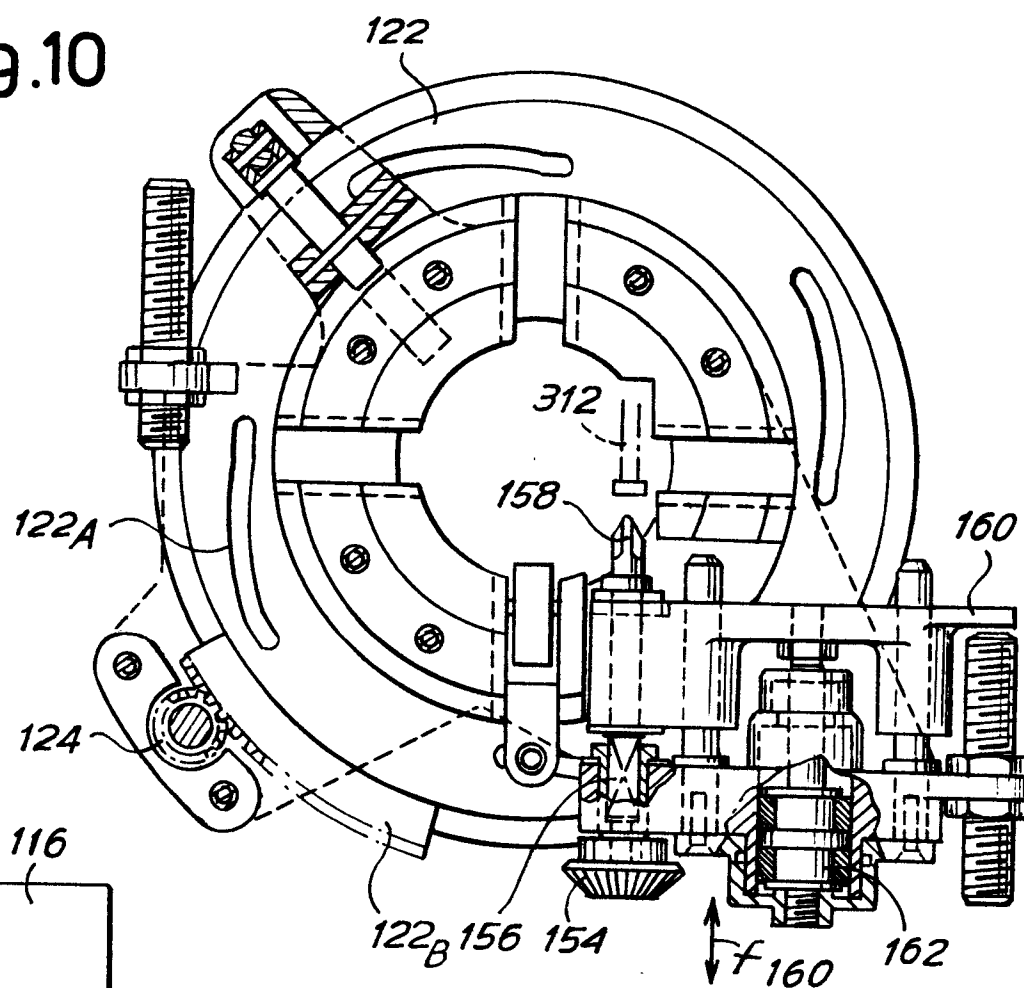


Fig.11

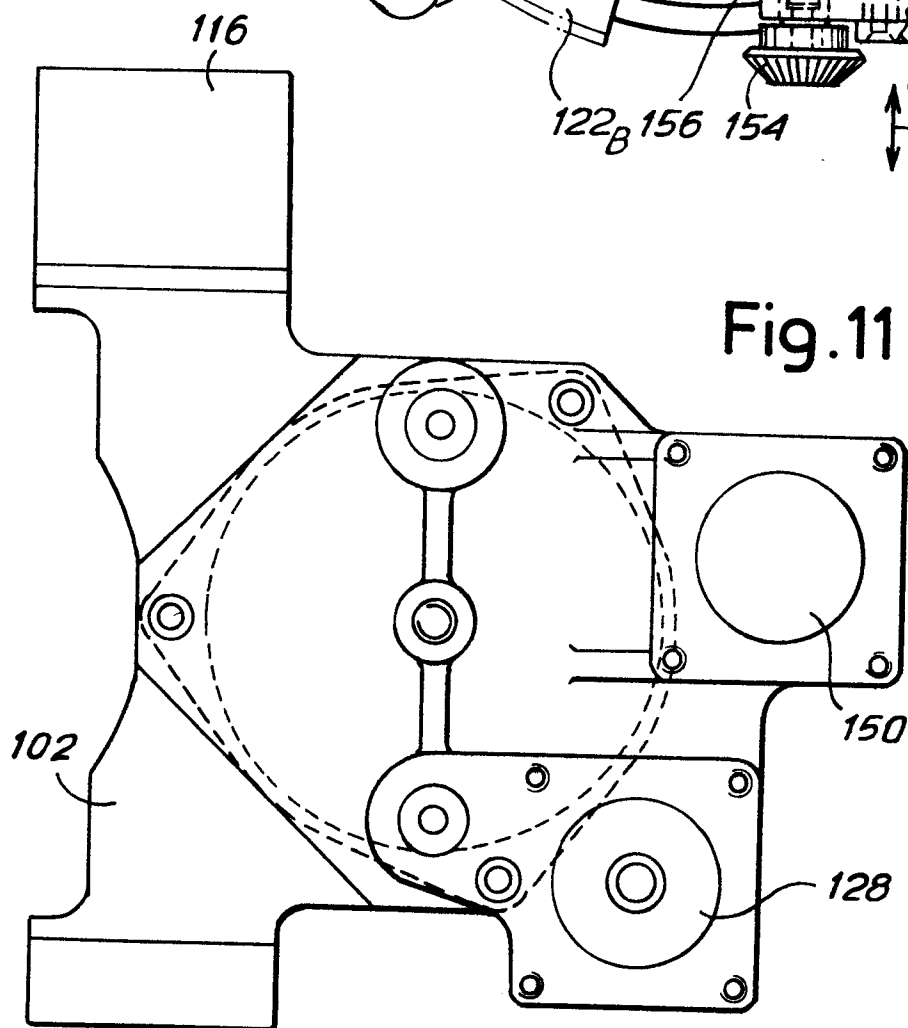


Fig.12

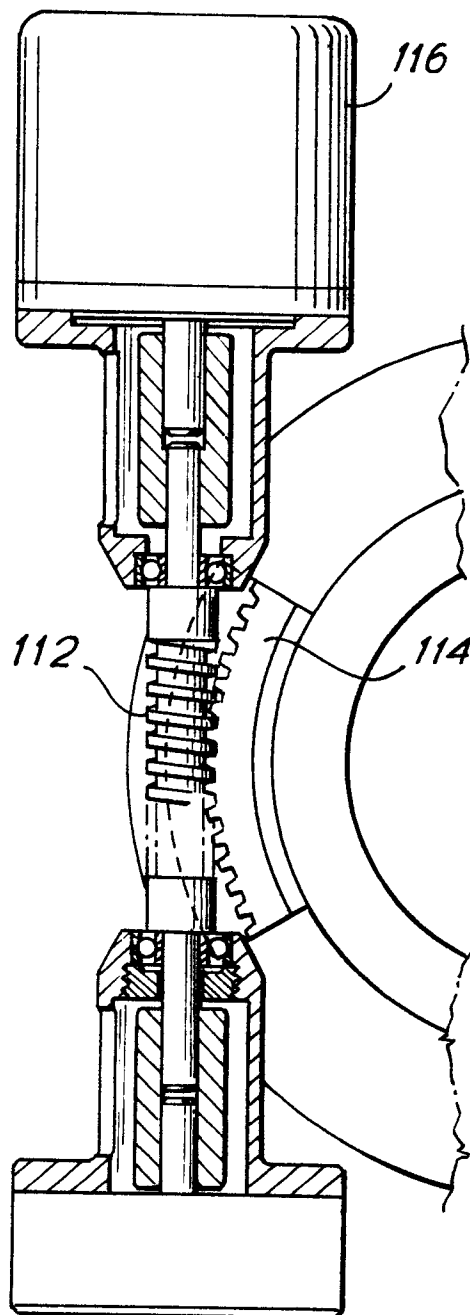


Fig.13

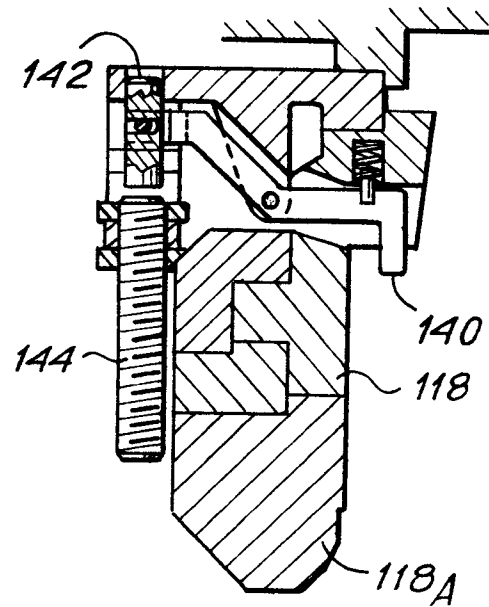


Fig.14

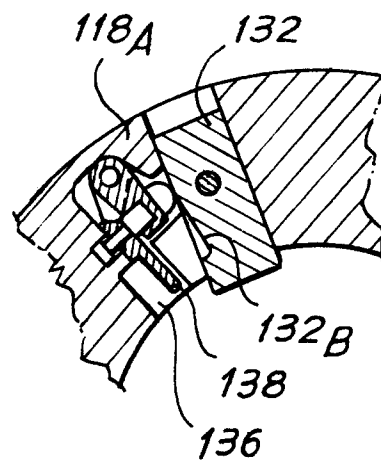




Fig.15

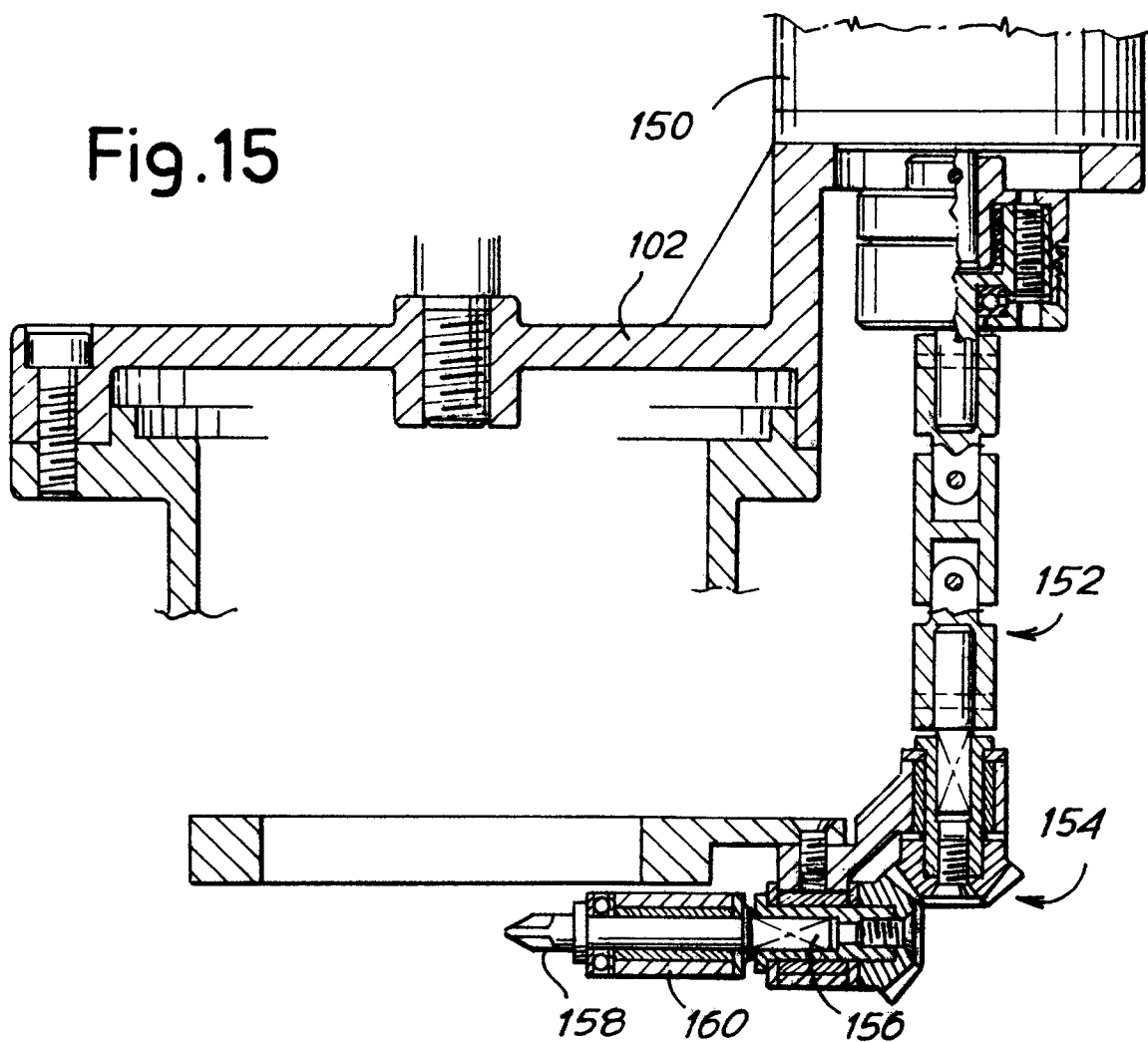


Fig.16

