CLAIMS

1. A device for continuous and discriminated positioning of each blade of hydraulic turbines at vertical axis characterized by an arrangement of three electrical stepper motors on a single maneuvering screw for handling rotary-transfer (contemporary rotation and translation) and swinging movement (fluctuating movement) of blades and by utilization of two separated coplanar floating disks placed on a rotating barrel layer, the device having:

- a first electrical stepper motor (ref. 1 of Fig. 2) connected with a flange to its own worm gearbox (ref. 46 of Fig. 2) with a first crown gear (ref. 62 of Fig. 2) rigidly connected to the end of a maneuvering and connection screw (ref. 4 of Fig. 2);

- an assembly consists of electrical stepper motor (Fig. 2 ref. 1); worm gear box (Fig. 2 ref. 46); maneuvering and connection screw (Fig. 2 ref. 4), the assembly can rotate on a pin (ref. 50) by an angle ± **α** in respect to support (ref. 49), secured to a first one of the floating disk (ref. 48 of Fig. 1) that is connected to the hydraulic turbine by means of pillars (ref. 47 of Fig. 1);

- the maneuvering and connection screw (ref. 4) that is moved by the electrical stepper motor (ref. 1) receiving the rotary motion by the first crown gear (ref. 62), while the other end of the maneuvering and connection screw (ref. 4) is idle on the support attached to the box (ref. 64 of Fig. 3);

- on the maneuvering and connection screw (ref. 4) are combined two separated female screws (ref.6 of Fig. 1 and Fig. 2; ref. 7 of Fig. 1 and Fig. 5) such that for a given rotation of the electrical stepper motor (ref. 1) the female screw (ref. 6) moves for a certain distance **rx**;

- on the female screw (ref. 6) is hinged, in idle status (in other words is not engaged), an idler roller (ref. 5) that will move for the same distance **rx**; wherein the idler roller (ref. 5) is connected to the fixed part of the hydraulic turbine and makes the repositioning **rx** of a housing support (ref. 8) that is instead connected to other floating disk (ref .40 of Fig. 5);

- a second electrical stepper motor (ref. 2 of Fig. 1) is flanged on top of box (ref. 64 of Fig. 3) that through a connecting joint sets in rotation the conical pinion (ref. 55), which engages a corresponding crown gear (ref. 56 of fig. 3), wherein the corresponding crown gear is a second crown gear (56);

- on the second crown gear (ref. 56) is keyed in the endless screw (ref. 57) that engages a third crown gear (ref. 58) that puts in slow rotation the shaft (ref. 59), which has at its edge mounted the pinion (ref. 60) that engages a forth crown gear (ref. 65) secured to other floating disk (ref. 48 of Fig.1);

- a third electrical stepper motor (ref.3 of Fig.1) puts in rotation the endless screw (ref.7 of Fig.5) connected to the shaft of the third electrical stepper motor.

2. The device as claimed in claim 1 characterized by the motion irreversibility of each of the three electrical stepper motors, connected to their own gear trains, condition required to maintain the position even in case of electrical power failure supply to the electrical stepper motors.

3. The device as claimed in claim 1 characterized by the fastening of maneuvering system (electrical stepper motors - gear trains - screw) to a single support disk linked to the external frame supporting the hydraulic turbine.

4. The device as claimed in claim 1 characterized by the utilization of two separated coplanar floating disks (ref. 37 and 40 of Fig. 5), one inside the other one and both placed on the rotating barrel layer (ref. 31 of Fig. 5).

5. The device as claimed in claim 4 characterized by the coaxial fastening of the internal floating disk (ref. 40 of Fig. 5) to a joint pivot (ref. 30 of Fig.5) with levers in idle status (in other words non engaged) (ref. 12 of Fig. 4 and 5).

6. The device as claimed in claim 5, characterized by the stacked and sequential arrangement on the joint pivot (ref. 30 of Fig. 5) holding the levers in idle status.

7. The device as claimed in claim 5 characterized by the utilization of two articulated rods, for each blade holder shaft, of which one is hinged on the joint pivot (ref.30 of Fig.5) and the second one hinged between the center line of the first and one guide skid pin.

8. The device as claimed in claim 7 characterized by the utilization of a linear guide slopes (ref. 52 and 54 of Fig. 3) whose support is linked to the bottom of the rotating housing (ref. 8 of Fig. 2) which bears a hinged pivot of the second rod, and at the end has a guide loop for motion control pivot sliding.

9. The device as claimed in claim 4 characterized by the utilization of a lever hinged to a pivot linked to the bottom of the rotating housing (ref. 8 of Fig. 2), at one end there is a pivot inside the skid guide loop, while at the other end there is a guide loop for motion control pivot sliding (ref. 18 and 44 of Fig. 4).

10. The device as claimed in claim 4 characterized by the utilization of a floating disk with spokes (ref. 40 of Fig. 5), the disk itself has pivots for levers motion control and the spokes are connected to external floating disk (ref. 37 of Fig.5) by means of pillars.

11. The device as claimed in claim 7 characterized by the utilization of orthogonal guide skids with an interposed halfway support disk, one skid is linked to the rotating barrel bottom, while the other one is linked to the floating disk with spokes (ref. 40 of Fig. 5).

12. The device as claimed in claim 7 characterized by the utilization of connecting rods between levers (ref. 12 of Fig. 4) hinged to the joint pivot (ref.30 of Fig.5) and the blade holder shafts.

13. The device as claimed in claim 7 characterized by the utilization of screw locking keying on the blades holder shafts connected to the rods.

14. The device as claimed in claim 7 characterized by the assembly of the blades holder shafts on two end bearings, one linked to the bottom and the other one to the cover of the rotating barrel.