CLAIMS

1. An ion implantation machine comprising:

• an enclosure ~~(ENV)~~ that is connected to a pump device ~~(VAC)~~;

• a negatively polarized ~~(HT)~~ substrate-carrier ~~(PPS)~~ that is arranged inside said enclosure ~~(ENV)~~; and

• a plasma feed device ~~(AP)~~ in the form of a generally cylindrical body extending between an initial section and a terminal section, the device having a main chamber ~~(PR, PR2)~~ provided with an ionization cell ~~(BC1, ANT1)~~;

said main chamber ~~(PR, PR2)~~ being provided with a gas delivery orifice ~~(ING, INL)~~; and

the final section ~~(CL)~~ of said main chamber being provided with head-loss means for creating a pressure drop relative to said body ~~(AP)~~;

~~the machine being characterized in that~~wherein said plasma feed device ~~(AP)~~ also includes an auxiliary chamber ~~(AUX)~~ arranged beyond said final section, said auxiliary chamber opening out into said enclosure ~~(ENV)~~ at said terminal section; and

wherein said auxiliary chamber is provided with a second ionization cell.

~~2. A machine according to claim 1, characterized in that said auxiliary chamber (AUX) is provided with a second ionization cell (BC2, ANT2).~~

~~3~~2. A machine according to claim 1 ~~or claim 2~~, ~~characterized in that~~wherein said plasma feed device ~~(AP)~~ presents a volume that is smaller than the volume of said enclosure ~~(ENV)~~.

~~4~~3. A machine according to ~~any one of~~ claims 1 ~~to 3~~or claim 2, ~~characterized in that~~wherein said final section is in the form of a partition ~~(CL)~~ pierced by a plurality of holes.

~~5~~4. A machine according to ~~any one of~~ claims 1 ~~to 3~~or claim 2, ~~characterized in that~~wherein said final section ~~(ST)~~ presents an

opening ~~(VS)~~ of area that is small relative to the area of any of the sections of said body ~~(APB)~~ lying between said initial section and said terminal section.

~~6~~5. A machine according to any preceding claim, ~~characterized in that~~wherein said first ionization cell has an excitation coil ~~(ANT1)~~ and a confinement coil ~~(BC1)~~.

~~7~~6. A machine according to any preceding claim, ~~characterized in that~~wherein the axis ~~(AXT)~~ of said substrate-carrier ~~(PPS)~~ and the axis ~~(AXP)~~ of said plasma feed device ~~(AP)~~ are two distinct axes.

~~8~~7. A machine according to claim ~~7~~6, ~~characterized in that~~wherein said substrate-carrier ~~(PPS)~~ and said plasma feed device ~~(AP)~~ present an adjustable offset.

~~9~~8. A machine according to any preceding claim, ~~characterized in that~~wherein said final section is removable.

~~10~~9. A machine according to any preceding claim, ~~characterized in that it includes~~further comprising at least one additional plasma feed device.

~~11~~10. A machine according to any preceding claim, ~~characterized in that it comprises~~further comprising:

- a voltage source ~~(SOU)~~ having its positive pole connected to ground;
- a capacitor ~~(CDD)~~ connected in parallel with said voltage source ~~(SOU)~~; and
- a switch ~~(SW)~~ connected between the negative pole of said voltage source ~~(SOU)~~ and said substrate-carrier turntable ~~(PPS)~~.

~~12~~11. A machine according to any preceding claim, ~~characterized in that~~wherein said substrate-carrier turntable ~~(PPS)~~ is movable in rotation about its axis ~~(AXT)~~.

~~13~~12. A machine according to any preceding claim, ~~characterized in that~~wherein said substrate-carrier turntable ~~(PPS)~~ is disk-shaped and the distance between said substrate-carrier turntable and said plasma feed device ~~(AP)~~ is greater than the diameter of said substrate-carrier.

~~14~~13. A machine according to any preceding claim, ~~characterized in that~~wherein said head-loss means ~~(CL, VS)~~ are electrically insulating.