Title (en)

ASSEMBLY FOR SEPARATING AND METHOD FOR WEIGHING THE INERTIAL MASS AND HEAVY MASS OF CHEMICAL SUBSTANCES AND PHYSICAL BODIES

Title (de)

ANORDNUNG ZUR TRENNUNG UND VERFAHREN ZUR WÄGUNG VON TRÄGER MASSE UND SCHWERER MASSE CHEMISCHER STOFFE UND PHYSIKALISCHER KÖRPER

Title (fr)

SYSTEME POUR SEPARER ET PROCEDE POUR PESER LA MASSE INERTE ET LA MASSE LOURDE DE SUBSTANCES CHIMIQUES ET DE CORPS PHYSIQUES

Publication

EP 1141666 A2 20011010 (DE)

Application

EP 00938571 A 20000516

Priority

- DE 0001577 W 20000516
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Abstract (en)

[origin: DE19927026A1] The invention relates to a technological assembly for separating the heavy mass and the inertial mass of chemical substances and physical bodies, using horizontal components with independent electric field strengths of the earth's gravitational and rotational fields and also to a technological method for measuring the heavy rest mass and the inertial rest mass of a substance and a body. Said assembly consists of a vertical torsion balance (1) which is used to obtain the perpendicular position of the weighing beam and to cause the horizontal electric field strength component to act upon the quantity of the substance to be weighed. The assembly also consists of a signal system (2) for the derivation of the measurement signals, a receiver and transducer system (3), an amplifier and measurement value memory system (4) and of the display device (5) for the measured variables. The powerful effect of the perpendicular components of the earth's gravitational field which are used in the weighing balance is eliminated by the perpendicular position of the vertical balance and a horizontal driving motion around a horizontal rotating shaft which is mounted in a frictionless manner. An elastic bearing maintains the stable position of the driving motion acting on the balance container for the substance quantity. Said bearing is produced in a special manner from play-free, rotating elastic bearing bodies. A linear guidance of the substance portion, at points where said portion periodically rests, is achieved in the stationary state, with a tolerance in the nano-range. The characteristic deviation lies in the range of 150 nanometers to picometers. In this manner, the smallest quasi-atomic lifting paths can be realised for each guidance period. The time measurement tolerance for the temporal interval of the rest points, obtained using the synchronously adjusted intrinsic swing duration of the vertical balance, when calculated over two measuring cycles, lies between 5 and 10 minutes for the separate weighing of heavy mass and inertial mass in the nanosecond range. The measuring result is made up of the quantity of the heavy mass and the quantity of the inertial mass of the substance quantity, expressed in a unit equivalent to the quantity of their mass weight.

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G01G 1/00

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