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GB 1396414 GB 0983760
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B2J
Selected US specifications from IPC sub-class B04B

(54) **Centrifuge metal particle accumulation device**

(57) A centrifuge consists of a removable accumulation dish 1 having an upstanding rim portion and mounted on a supporting, rotating platform 5. Metal particles in a fluid medium are fed centrally of the dish via a tube or nozzle 3. The metal particles, as a result of centrifugal force accumulate as a closely defined ring formation against the rim portion of the dish and the liquid overflows the rim portion. A magnetic or electric field may be additionally provided so as to influence the trajectory of ferrous particles, thereby increasing the efficiency of accumulation. The dish may be used in conjunction with apparatus for measuring particle quantity.

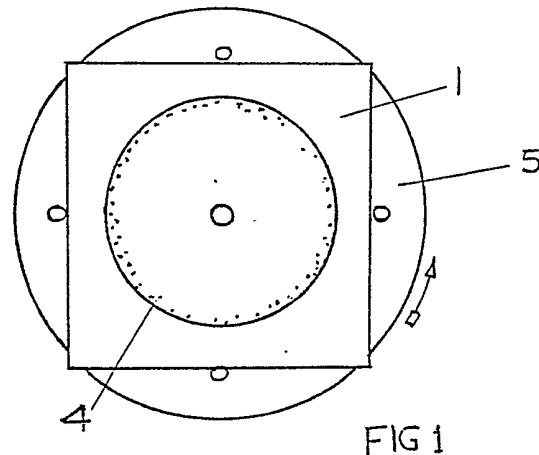
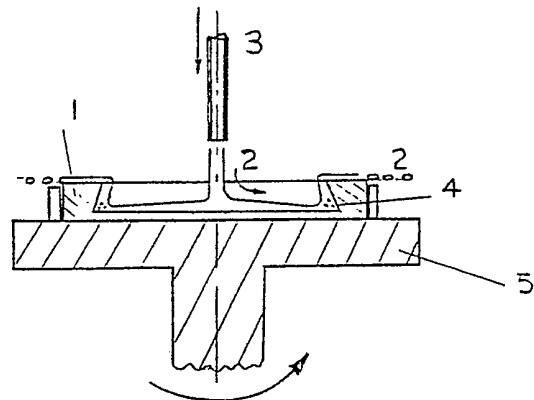


FIG 1

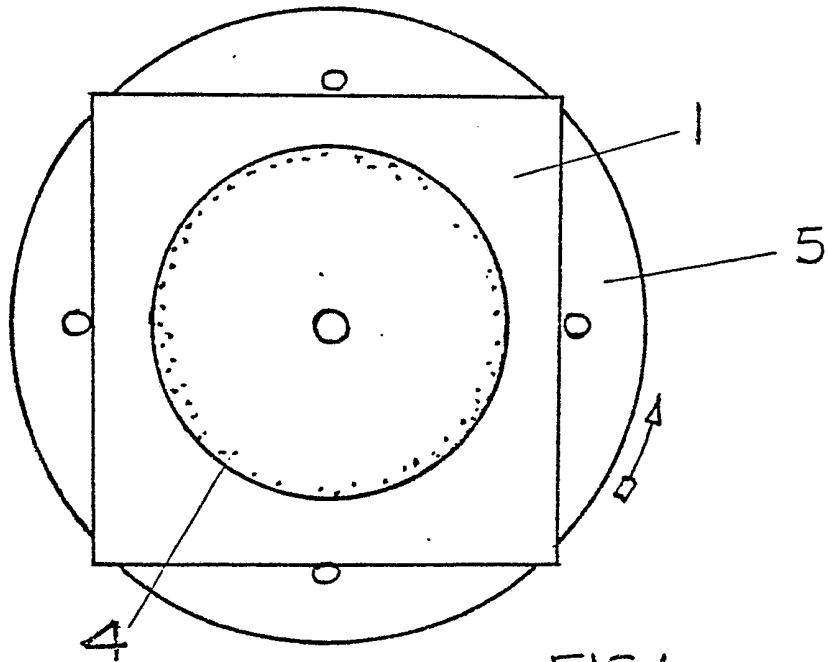
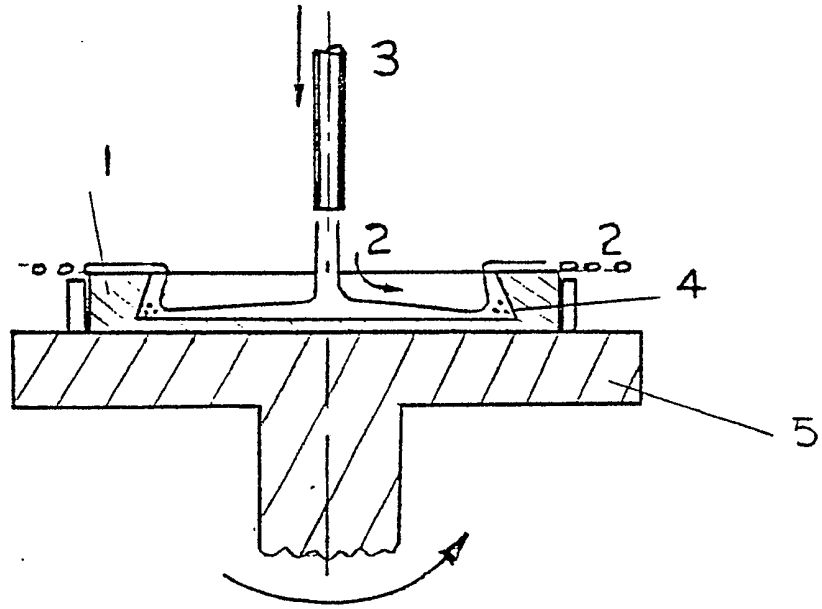


FIG 1

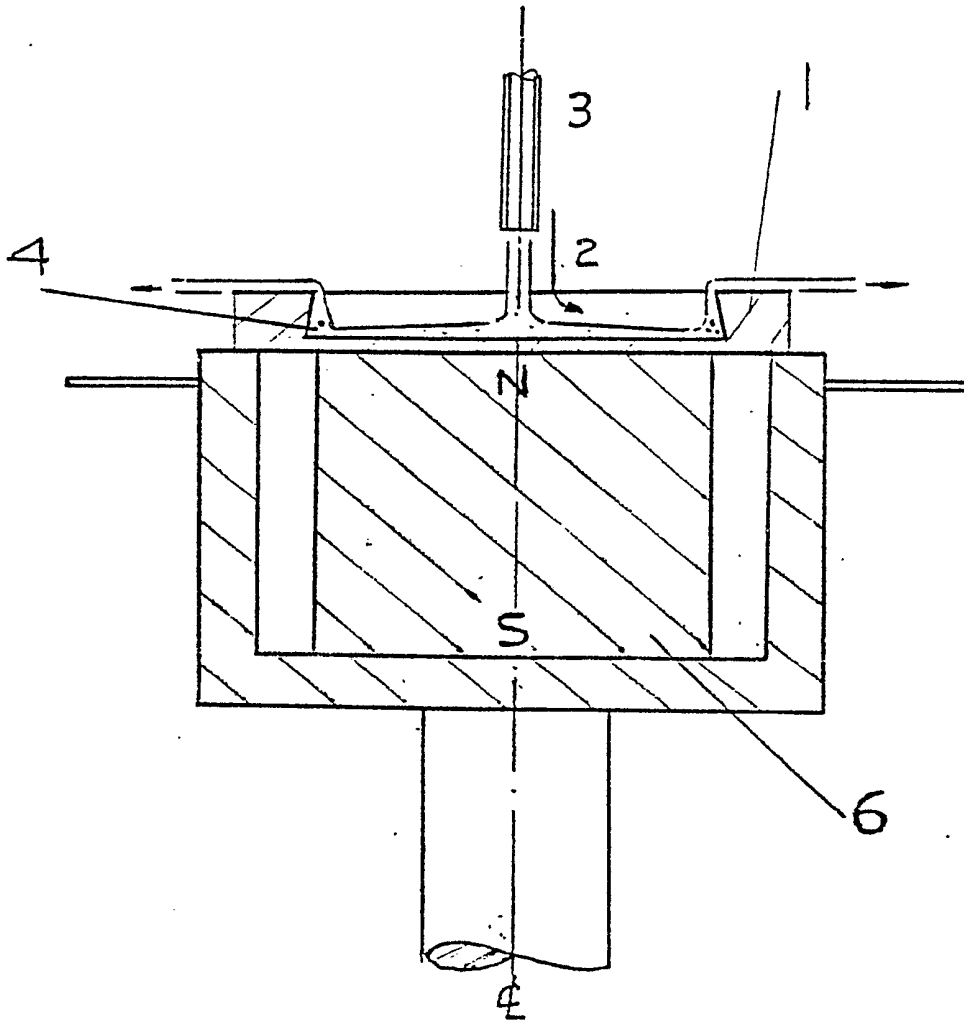


FIG 2

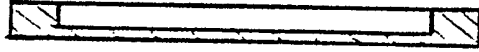
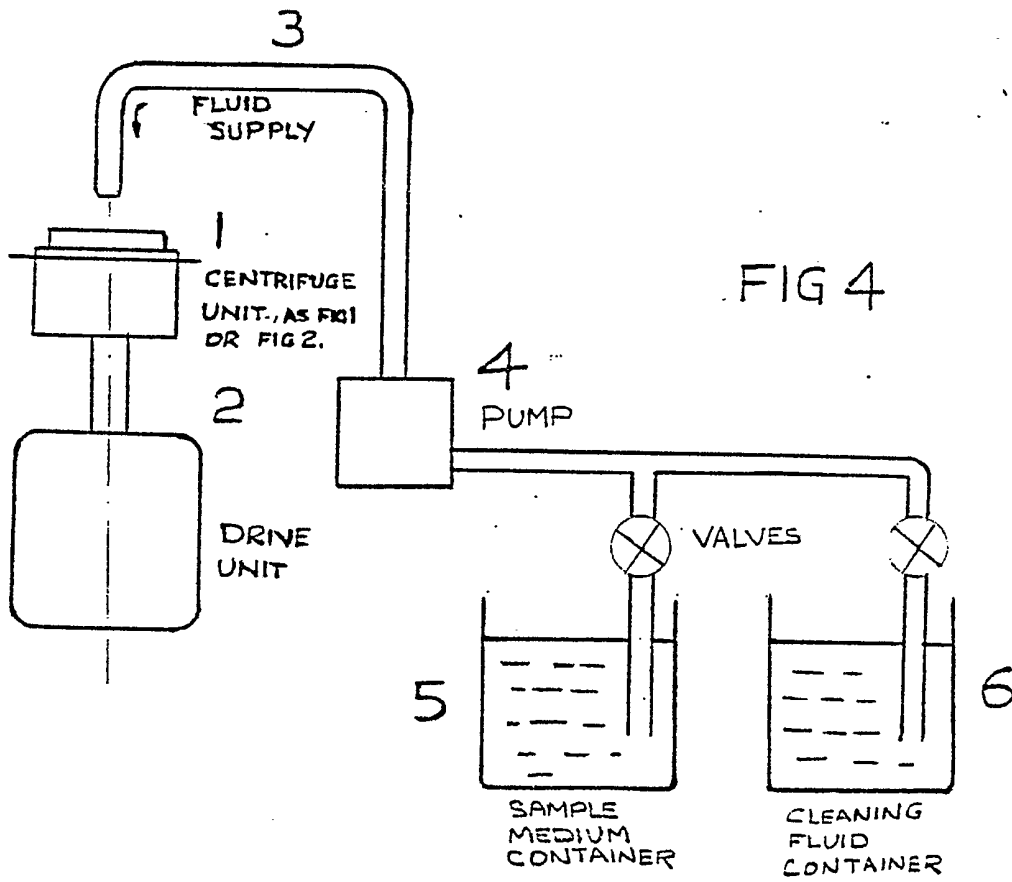


FIG 3



SPECIFICATION

Centrifuge metal particle accumulation device

5 This invention relates to a metal particle accumulation device, which may be used in conjunction with British Patent No. 8509040 as well as other instruments used for Particle Quantification.

10 The ideal metal particle formation for the Particle Quantifier is a circular ring formation of closely defined boundary limits.

15 According to the present invention, there is an instrument which constitutes a centrifuge comprising in part (see *Figure 1*), a removable shallow container of particular geometry, on which the particles are collected, called an accumulation dish (1). This is mounted and located on a platform (5) which may be rotated at speed as required. A known amount of fluid medium containing interspaced metal particles (2) is projected along or near to the axis of symmetry on to the rotating assembly comprising items (4) and (5).

20 The fluid medium and particles is supplied to and is then thrown outwards with centrifugal force toward the boundary wall of the accumulation dish. Since the metal particles have greater density than that of the fluid medium they move out more directly toward the boundary wall because of the inertial and gravitational forces acting on them. The particles are collected at the base of the boundary wall forming a concentrated ring of debris. This deposit of particles is cleaned of contamination by solvent cleaner which may be applied in a similar manner to that of the fluid medium.

25 In cases where the particle carrying fluid medium is of a viscous nature, a fluid of low viscosity may be added to give a resulting mixture with viscosity low enough to allow the metal particles to be easily pulled out of suspension by the centrifuge forces.

30 A modified form of the above centrifuge is shown in *Figure 2*. Here the rotating platform is modified to include a magnet, electromagnet or electric field (6), the purpose of which is to provide additional forces on particles of a ferro or para-magnetic nature so as to bring them into a trajectory nearer to the base of accumulation dish (1). This increases the incidence of particle collection and once again the particles are collected at the boundary wall.

35 Once the collection and cleansing processes are completed, the accumulation dish (1) with its ring formation of particles is both dried and removed and is ready for quantification measurement.

A new accumulation dish is used each time a new sample of particles is required for measurements. These may be easily stored for further reference.

55 CLAIMS

1. A metal particle centrifuge dish to be used for the accumulation and formation of particle deposits from a fluid medium suitable for Particle Quantification measurement.

2. A centrifuge as in Claim 1 consisting of a removable accumulation dish which may be mounted on a table which is able to be rotated about a vertical axis at necessary speed.

65 3. The centrifuge as in Claims 1 and 2 providing a

method of separating and collecting particles at the base of the dish in a bounded ring formation.

4. A means of increasing the efficiency of collecting and depositing ferro or paramagnetic particles by providing an additional magnetic or electric force field to modify the trajectory of the particles.

5. A means of applying a measured amount of a fluid medium containing interspaced metal particles on or near to the axis of the centrifuge, so that the particles may be separated and collected.

6. A means of cleansing the particles of fluid contamination by applying cleaning fluid.

7. A means of removing the accumulation dish with the collected particles in ring formation for Particle Quantification.

8. An instrument made up of the following:

(1) A centrifuge as in Claims 1 to 3 with removable accumulation dish.

(2) A means of boosting the efficiency in the case of ferro particles as in Claim 4.

(3) A fluid supply tube and nozzle.

(4) A controlled rate of supply pump (or syringe).

(5) A measure containing a known amount of fluid.

(6) A container of cleaning fluid to provide cleansing operation.

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