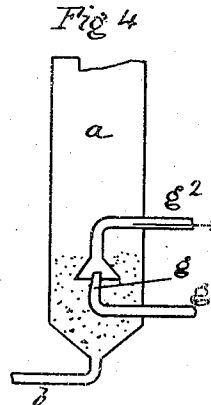
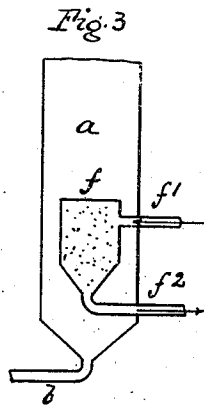
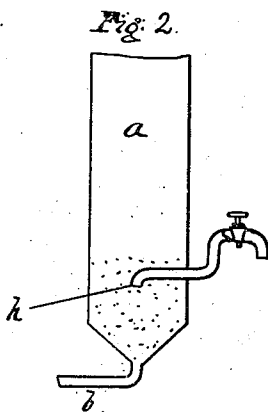
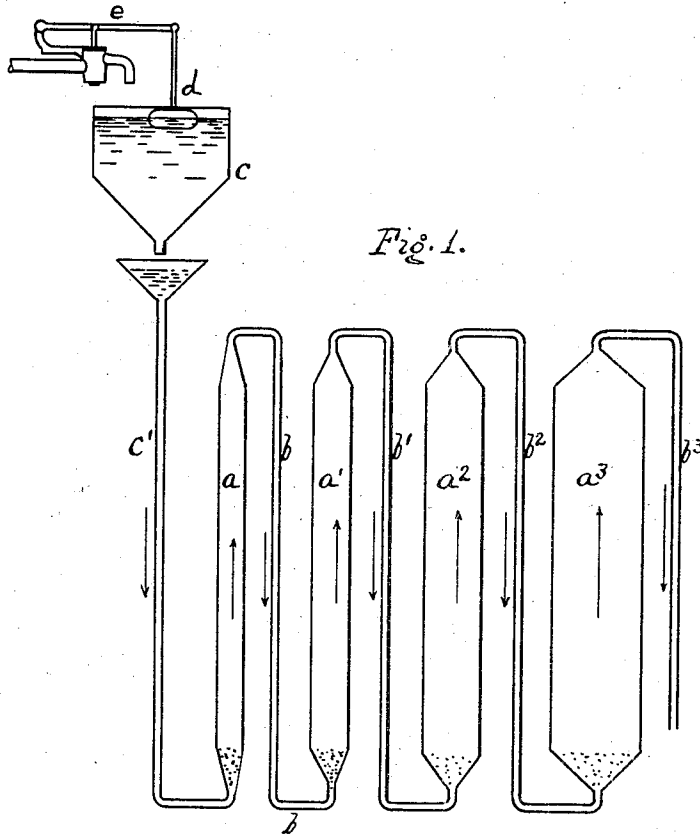


G. H. J. MONNET.
 APPARATUS FOR CLASSIFICATION OF FINE POWDERS.
 APPLICATION FILED FEB. 10, 1911.

1,057,870.

Patented Apr. 1, 1913.



Witnesses:
 Walter Abbr
 L. H. Grote

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UNITED STATES PATENT OFFICE.

GEORGES HENRI JOSEPH MONNET, OF STOLBERG, GERMANY, ASSIGNOR TO SOCIÉTÉ ANONYME DES MANUFACTURES DES GLACES ET PRODUITS CHIMIQUES DE SAINT GOBAIN, CHAUNY ET CIRCY, OF PARIS, FRANCE.

APPARATUS FOR CLASSIFICATION OF FINE POWDERS.

1,057,870.

Specification of Letters Patent.

Patented Apr. 1, 1913.

Application filed February 10, 1911. Serial No. 607,814.

To all whom it may concern:

Be it known that I, GEORGES HENRI JOSEPH MONNET, a citizen of the Republic of France, and a resident of Stolberg, Germany, have invented a new and useful Apparatus for Classification of Fine Powders, of which the following is a specification.

The present invention has for object an apparatus for the classification of fine powders in suspension in a liquid, subjecting in each classifying tube of a series all the grains to a vertical current of liquid, the speed of which is perfectly determined and is kept rigorously constant throughout the whole length of each tube, but decreases as it passes from one tube to the next.

The apparatus which permits the invention to be carried out consists broadly of a certain number of cylinders or prisms which are vertical and of great height in regard to their diameter, which latter goes on increasing from the first to the last of the series. The liquid charged with the powder to be classified traverses these cylinders from the bottom to the top. Finally the latter are mounted in series, that is to say they are all traversed by a current from the same source of supply and all the liquid which has traversed the first cylinder passes integrally into the next and so on to the last.

In the accompanying drawing: Figure 1 shows a diagrammatic section of the apparatus. Figs. 2, 3 and 4 show in vertical section modified constructions of the emptying device.

The cylinders a , a^1 , a^2 , a^3 of any number are connected to each other by tubes b , b^1 , b^2 , b^3 starting from the top of each cylinder and ending at the bottom of the next. The first cylinder receives the liquid from a reservoir c through a tube c^1 terminating at its base. The reservoir c is provided with a cock e controlled by a float d or any other device for insuring the constancy of the level in this reservoir. This supply apparatus has for its object to insure the constancy of the supply throughout the series of cylinders. In reality the reservoir c being separated from the tube c^1 acts in an independent manner to regulate the supply of the liquid which has to traverse the apparatus, and as the height of flow of the

liquid from the reservoir is kept constant, its supply is itself constant and independent of the density of the mixture (liquid and powder to be classified) introduced into the reservoir. The liquid which flows therefrom assumes automatically in the tube c^1 such a height of weight that it always passes through the deposited substances whatever be the amount or proportion of the resistances (essentially variable otherwise) created by the deposits accumulated at the base of the tubes. This supply regulator may also be replaced by any other device insuring the same result.

In each of the cylinders the speed of the current of liquid is absolutely invariable since it only depends on its section and the supply of the liquid, which are both constant, moreover, seeing that the cylinders are of great height in regard to their diameter, the particles in suspension may be subjected to the action of this constant current during a time which is sufficient for them to classify themselves according to their size or density. Those of which the speed of fall (considered in regard to the liquid supposed to be at rest) is greater than the speed of the current collect at the base of the cylinder. On the contrary those of which the speed of fall is less are carried onward toward the next cylinder. The only particles remaining in suspension in the liquid are those of which the speed is equal to that of the current. The same phenomenon is reproduced in each of the cylinders, the standard speed differing only from one cylinder to the next.

The substances which collect at the base of each cylinder allow, however, the liquid to pass through them. The height of the deposit which they attain must be very small in regard to the total height of the cylinder in order to allow the grains to be subjected throughout nearly the whole height of each cylinder, to the classifying influence due to the constancy of the speed of the current which traverses them.

The apparatus may be worked intermittently or continuously. In the former case after the complete treatment of a certain quantity of the substances, the deposit formed at the base of each cylinder is withdrawn by means of an outlet h made at its

center (see Fig. 2). In the second case the substances may be collected while the apparatus is working by means of an internal funnel f , (Fig. 3), arranged at the bottom of each cylinder and discharging at f^2 . The substances which have collected in the funnel are carried off by a current supplied through the tube f^1 and leave by the tube f^2 .

To collect the substances while the apparatus is working a central ejector g (Fig. 4) may also be employed and may be worked by water under pressure supplied through the tube g^1 and carrying off by the tube g^2 the products to such point as may be desired.

In all cases where the apparatus is emptied continuously while it is working the quantity of liquid passing through the emptying tube must be negligible in regard to the supply to the apparatus so as not to bring about disturbances in the working thereof.

The apparatus must also be provided with all the tubes necessary for the escape of the air carried into it, with pressure gages, etc., for facilitating the watching of its working without these accessories in any way modifying its principle.

All the arrangements are also only cited by way of example.

What I claim and desire to secure by Letters Patent of the United States is:—

1. Apparatus for classifying finely divided material suspended in a liquid, comprising a series of long, unobstructed vertical tubes, each of constant diameter throughout its length, said tubes varying as to their respective diameters, a series of connecting tubes, one connecting the top of one vertical tube with the bottom of the next, whereby they are all connected in series and means for maintaining an equal volume flow

through the series of tubes, substantially as described.

2. Apparatus for classifying finely divided material suspended in a liquid, comprising a series of long, unobstructed vertical tubes, each of constant diameter throughout its length, said tubes varying as to their respective diameters, a series of connecting tubes, one connecting the top of one vertical tube with the bottom of the next, whereby they are all connected in series and means for maintaining an equal volume flow through the said series of tubes, and means for withdrawing from the bottom of any tube the classified material therein while maintaining the flow of the classifying fluid therethrough practically undisturbed, substantially as described.

3. Apparatus for classifying finely divided material suspended in a liquid, comprising a series of long, unobstructed vertical tubes, each of constant diameter throughout its length, said tubes varying as to their respective diameters, a series of connecting tubes, one connecting the top of one vertical tube with the bottom of the next, whereby they are all connected in series and means for maintaining an equal volume flow through the series of tubes, together with means for automatically increasing the pressure of the feed of the suspension liquid as the deposit in the tubes increases, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses.

GEORGES HENRI JOSEPH MONNET.

Witnesses:

HENRY CUADFLIEG,
PAUL CHAUVEL.