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DEMOUNTABLE AND SEPARABLE PULVERIZER

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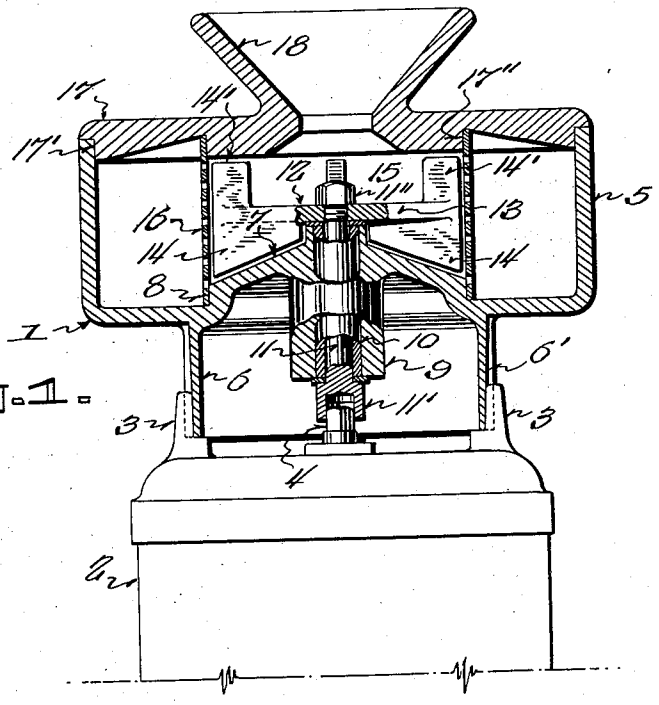


Fig. 1.

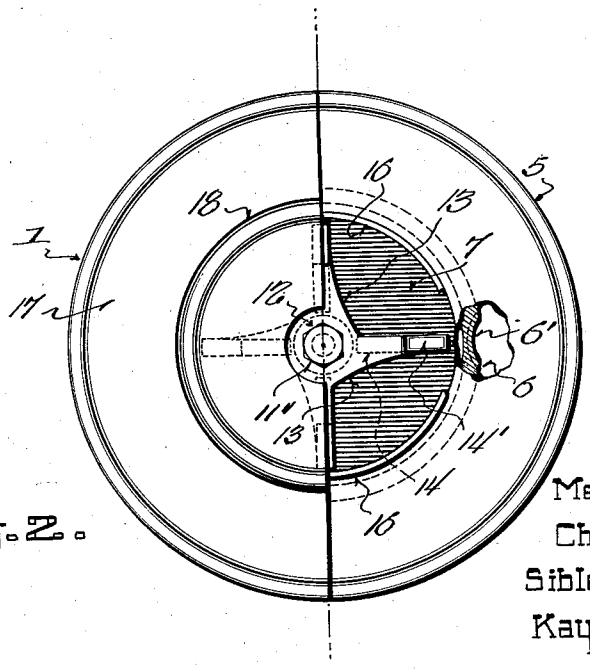


Fig. 2.

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DEMOUNTABLE AND SEPARABLE PULVERIZER

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3 Claims. (Cl. 241—74)

This invention pertains generally to pulverizers, and more particularly to a separable unit demountably supported upon an electrically operated source of power.

At the present time there is an acute need for a comparatively simple, compact and inexpensive pluverising unit for the preparation of relatively small batches of various granular materials, such as: plaster of Paris, drugs for pharmaceutical purposes, pigments for paint, samples for analytical work and many other laboratory techniques. In practically all instances, it is essential that there be no contamination of the material under treatment by that of a preceding batch, which necessitates thoroughly and completely cleaning the unit after each operation.

Therefore, the primary object of the present invention is to meet the foregoing requirements by the provision of a pulverizing unit capable of demountable support upon a motor actuator, and composed of easily separable parts to facilitate thorough cleaning between operations.

Incidental to the foregoing, a more specific object of the invention is to provide a pulverizing unit consisting of an annular receptacle having a vertical drive shaft centrally journaled therein, for detachable reception of a blade type rotor surrounded by a removable perforate circular band spaced from the receptacle wall, and a cover loosely supported upon the receptacle and having a central feed hopper communicating with the area surrounded by said band, said shaft having provision at its lower end for operative engagement with a power actuated drive shaft.

With the above and other objects in view, the invention resides in the novel features of construction fully described in the specification, and more particularly defined by the appended claims, it being understood that modifications in structure and design are contemplated within the scope of the invention.

In the drawing:

Figure 1 is a vertical sectional view through a pulverizing unit incorporating principles of the present invention; and

Figure 2 is a plan elevational view with a section of the cover cut away to more clearly illustrate structural features.

Referring now more particularly to the accompanying drawing, for illustrative purposes the pulverizing unit **1**, comprising the present invention, is shown supported upon a conventional electric motor **2**, the top of which is provided with annularly spaced supporting lugs **3** to receive the unit **1**. The armature shaft **4** of the motor **2** is squared at its projected edge for quick detachable engagement with the drive shaft of the unit **1**, to allow quick assembly and dismounting of the unit.

Unit **1** consists of an annular receptacle **5**, the bottom of which is provided with a circular depending apron **6** having annularly spaced grooves or keyways **6'**, for reception of the motor supporting lugs **3**, to firmly support the housing against rotation during operation, and allow easy assembly and removal of the same. The central

portion of the bottom of the receptacle **5** is formed in a conical dome **7**, providing an annular shoulder **8** substantially spaced from the sidewall of the receptacle.

Depending from the dome portion **7** of the receptacle bottom is a boss **9**, provided with a sleeve **10** in which a drive shaft **11** is journaled, the lower end of the shaft being provided with a socket **11'** for operable connection with the squared end of the motor armature **4**.

Mounted on the upper threaded end of the drive shaft **11**, and secured thereon by a cap screw **11''** is a rotor **12** comprising a plurality of radial spider arms **13** that carry depending blade portions **14**, the lower edges of which conform to the conical contour of the dome **7**. Extending upwardly from the outer ends of the arms **13** and the blades **14**, are extensions **14'** that define a central receiving area **15** for reception of material to be treated.

Loosely mounted within the receptacle and engaged by the annular shoulder **8** formed in the bottom receptacle, is a circular perforate band **16**. A cover **17** loosely seated on the top edge of the receptacle wall forms a closure for the receptacle, and also serves to firmly hold the perforate band **16** in operative position by means of an annular shoulder **17''** formed in the bottom face of the cover. A peripheral shoulder **17'** formed on the edge of the cover holds the same against lateral movement. The cover **17** is further provided with a hopper **18** communicating with the central receiving area **15** to facilitate delivery of material to the pulverizer, and also serve to adequately confine the same during the pulverizing operation.

From the foregoing explanation, considered in connection with the accompanying drawing, it is believed that the structure of the present invention will be well understood. However, for a complete appreciation of the advantages derived, the operation and method of use will be briefly discussed.

In the operative position shown in Figure 1, it will be apparent that the motor armature **4**, to which the drive shaft **11** is operatively connected, will cause the rotor **12** with its blades to be revolved at any speed desired, and as granular material is fed into the receiving areas **15** through the hopper **18**, the centrifugal action of the spider arms **13** will cause the same to be thrown outwardly into engagement with the blades **14** and the extensions **14'**, the impact of which will cause the material to break up into smaller particles after which it contacts the perforated band **16**, causing the material to be further ground or masticated to sufficient fineness to be forced through the perforations in the band **16** and stored in the annular space between the band and outer wall of the receptacle, until treatment of the batch has been completed.

After the foregoing operation, the unit is merely lifted from its support, and removal of the cover allows the material to be emptied and the perforated band **16** to be removed for thorough cleaning of both the receptacle and perforate band **16**. If desired, the rotor **13** can also be removed by releasing the cap nut **11''**, although this may not be essential in all instances.

It will be apparent from the foregoing that an exceedingly simple, compact and inexpensive pulverizing unit has been devised, which will not only efficiently pulverize practically all types of granular material, but because of complete separability of the parts composing the unit, the same can be quickly and easily cleaned to prevent any contamination of a new batch of material under treatment.

Having illustrated and described one form of the present invention in considerable detail, what we claim is:

1. A pulverizing unit comprising an open top receptacle, a vertical drive shaft centrally journaled in said receptacle, a rotor of the blade type mounted on said drive shaft within said receptacle, an annular shoulder concentric with said drive shaft formed on the bottom

of said receptacle, a detachable cover loosely mounted on the upper edge of said receptacle and provided with a central feed hopper, an annular shoulder formed on the bottom face of said cover concentric with the bottom shoulder, and a circular perforate band loosely mounted within the receptacle and engaged by said bottom and cover shoulders to firmly hold the band in operative position substantially spaced from the wall of the receptacle.

2. An open top receptacle, a vertical drive shaft centrally journaled in the bottom of said receptacle, a rotor secured on said drive shaft within said receptacle, said rotor consisting of a plurality of radial spider arms having depending blade portions provided with vertical extensions adjacent their outer ends to define a central receiving area, a perforate band surrounding said rotor and spaced substantially from the wall of said receptacle, and a cover loosely supported upon the top of said receptacle and provided with a central feed hopper communicating with said receiving area.

3. A pulverizing unit comprising an open top receptacle, a central conical dome formed on the bottom of said receptacle to provide an annular shoulder, a boss depending from said dome, a drive shaft journaled in said boss and provided with a socket for operable reception

of a power drive shaft, a rotor detachably secured to the upper end of said drive shaft and comprising radial blades, the lower edges of which conform to the contour of said conical dome, vertical extensions formed at the outer ends of said blades to define a central receiving area, a cover loosely mounted on the upper edge of said receptacle and provided on its lower face with an annular shoulder concentric to the shoulder formed by said conical dome, a central hopper formed in said cover and communicating with said receiving area, a circular perforate band loosely mounted within said receptacle and engaged by said bottom shoulder, the upper end of said band being engaged by the annular cover shoulder, and means depending from said receptacle for supporting the same upon a power actuator, said supporting means being held on said actuator against rotary and horizontal movement.

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