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H. SCHULTZ

2,144,857

SANDGLASS

Filed March 31, 1936

FIG. 1.

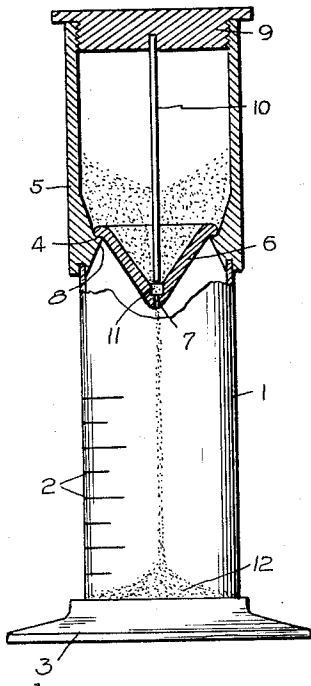


FIG. 2.

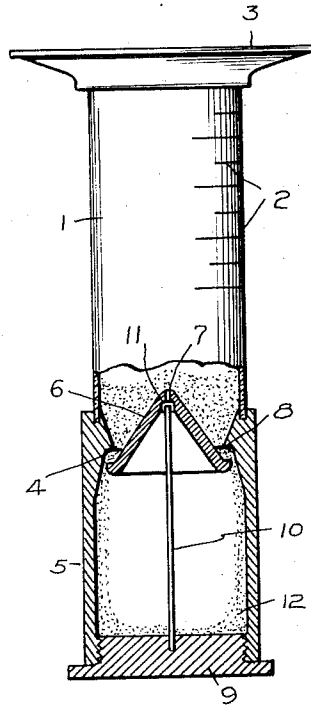
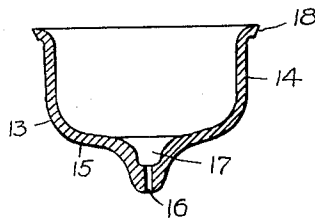


FIG. 3.



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2,144,857

SANDGLASS

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1 Claim. (Cl. 161—15)

My invention relates to sand-glasses of the type comprising means for a rapid return of the sand from the measuring chamber to the storage chamber, and more particularly to a sand-glass in which a valve having a vent therein is provided between the storage chamber and the measuring chamber.

The objects of my invention are: first, to provide a sand-glass of this type, in which the opening and closing of the valve can be effected rapidly by reversing the glass; second, to produce a sand-glass, in which the movability of the valve will not be impaired by sand particles; third, to provide a valve construction which is not sensitive to the grinding action of the sand, and fourth, to afford accurate closing of the valve and of the vent, respectively, in either position of the valve.

I accomplish these objects by means of a cylindrical container comprising an annular valve seat between the storage chamber and the measuring chamber, a conical cup-shaped valve having a vent in its apex and being adapted to drop freely from said seat in axial direction with respect to the container, and a fixed stop arranged to be contacted by the apex of said cup-shaped valve to limit the drop of the latter and simultaneously close the vent in its apex.

My invention is illustratively exemplified in the accompanying drawing, in which,

Fig. 1 shows a side view, partly in section, of a sand-glass, according to my invention in measuring position;

Fig. 2 is a view similar to that of Fig. 1, of the glass in reversed position;

Fig. 3 is a cross-section of a valve body having a substantially cylindrical upper portion and a substantially conical base portion.

Referring to the figures and particularly to Fig. 1, 1 denotes a glass cylinder provided with a scale 2 to measure the sand accumulating in the glass cylinder during a predetermined time. The lower end of the cylinder 1 is secured in a base 3, while its upper open end is inserted in the lower edge of a second cylindrical container 5. An inwardly projecting annulus 4 is provided on the inner wall of the container 5 adjacent the lower edge thereof. The upper surface of the annulus 4 comprises an outer conical portion and an inner portion 8 disposed substantially at right angles to the cylinder axis to form a valve seat, while the lower surface of the annulus 4 is of conical shape. A conical cup-shaped valve 6 with an annular flange disposed adjacent its open

end is seated on the valve seat 8, and provided with a vent 7 and a recess 11 in its apex. The upper end of the container 5 is closed by means of a screw cover 9 which carries axially of the cylinder a rod 10 projecting into the cup-shaped valve 6 and terminating at a point short of the apex of the latter. In the position of the sand-glass shown in Fig. 1 the sand flows from the storage chamber 5 into the measuring chamber 1 at a rate predetermined by the diameter of the vent 7. When the sand-glass is reversed, as shown in Fig. 2, the valve 6 drops from the seat 8 and its inner apex strikes the tip of the rod 10. In this position an annular opening is formed between the valve 6 and the annulus 4, which is several times larger in diameter than the vent 7 and through which the sand returns rapidly to the storage chamber. During its flow in this direction the sand is guided by the above-mentioned conical surface of the annulus 4. No connection at all exists between the valve and the valve seat, and any collection of sand on the valve seat is effectively avoided.

When the glass is reversed once more, the valve 6 drops immediately on its seat 8, owing to the short distance of the tip of rod 10 from the inner apex of the valve in closed position of the latter.

Fig. 3 shows a second embodiment of a valve having an annular flange 13, a cylindrical portion 14, a conical portion 15, a recess 17, and a vent 16. The particular shape of the valve illustrated in Fig. 3 facilitates the flowing of the sand through the vent without leaving any residue.

I claim:

An invertible sand-glass comprising a cylindrical container medially provided with an inwardly projecting annular valve seat, a substantially conical cup-shaped valve partitioning said container into two chambers and having an annular rim to contact said seat and a vent at its apex for slow flow of sand therethrough from one chamber to the other in one position of said sand-glass said valve being adapted to drop freely from said seat in axial direction with respect to said container, thereby permitting a rapid return flow of sand around the periphery of the valve, when the glass is inverted, and a fixed stop arranged to be contacted by the apex of said cup-shaped valve in said inverted position of the said glass to limit the drop of the valve and simultaneously close the vent in the latter.

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