

July 11, 1944.

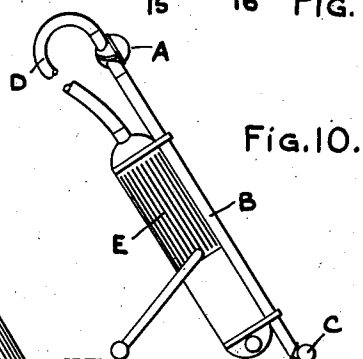
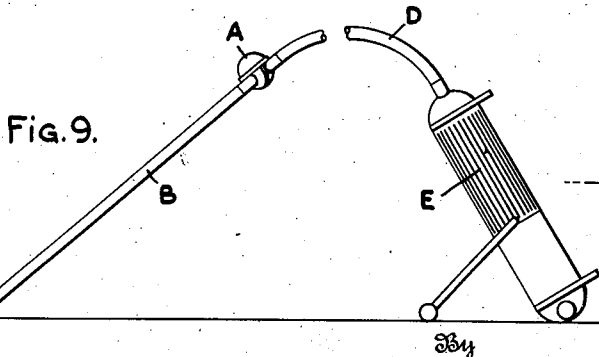
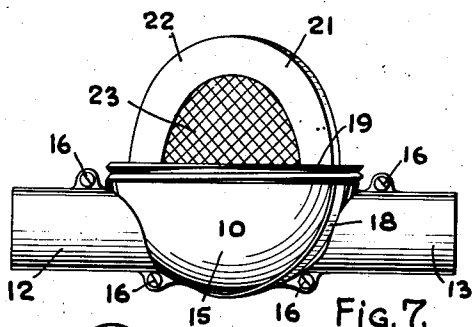
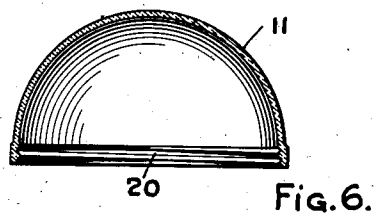
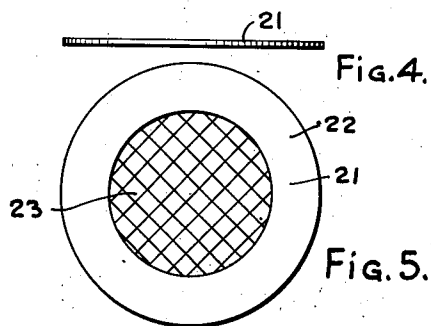
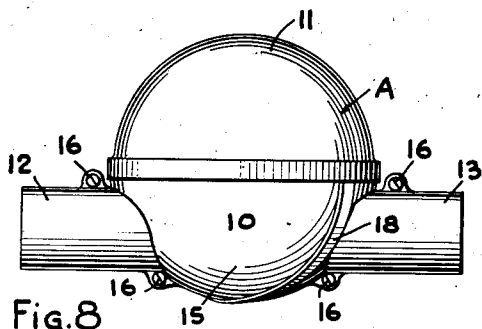
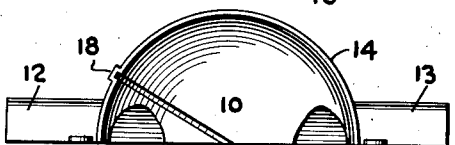
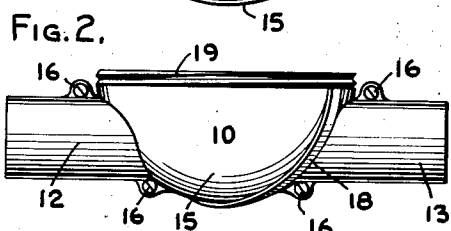
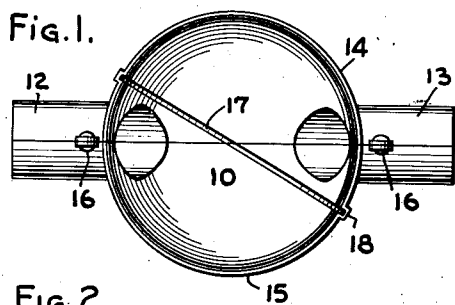
D. B. REPLOGLE

2,353,621

DUST INDICATOR FOR AIR-METHOD CLEANING SYSTEMS

Filed Oct. 13, 1941

2 Sheets-Sheet 1



Inventor
D. B. REPLOGLE,

Mumson H. Lane
Attorney

July 11, 1944.

D. B. REPLOGLE

2,353,621

DUST INDICATOR FOR AIR-METHOD CLEANING SYSTEMS

Filed Oct. 13, 1941

2 Sheets-Sheet 2

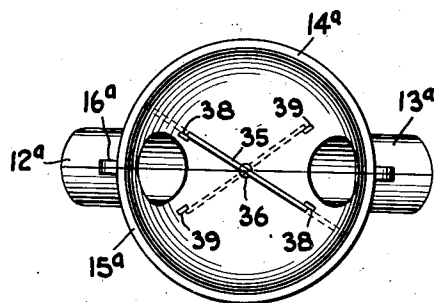
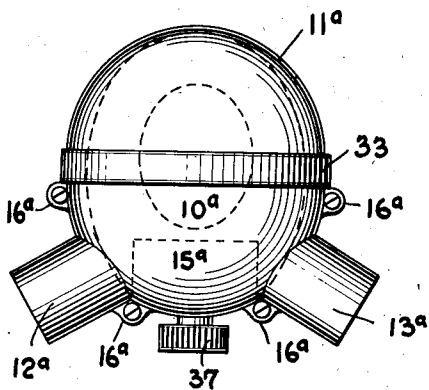
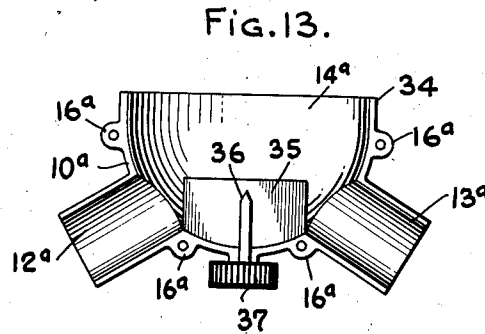
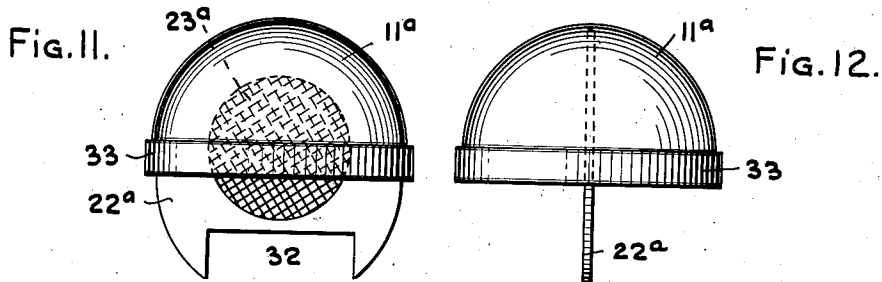


Fig. 15.

Fig. 14.

Inventor
D. B. REPLOGLE,

By *Munson H. Lane*
Attorney

UNITED STATES PATENT OFFICE

2,353,621

DUST INDICATOR FOR AIR-METHOD
CLEANING SYSTEMS

Daniel Benson Replogle, Berkeley, Calif.; Bank of America National Trust and Savings Association, Carl S. Replogle, Harold E. Queen, and Laurie H. Bullock, executors of said Daniel Benson Replogle, deceased, assignors to The Ohio Citizens Trust Company, Toledo, Ohio, a corporation of Ohio, trustee

Application October 13, 1941, Serial No. 414,858

7 Claims. (Cl. 302—65)

The invention relates to dust indicator for air-method cleaning systems and relates to the same general subject matter as Patent No. 2,293,920, and in my co-pending application, Ser. No. 412,861, filed Sept. 29, 1941.

The present device comprises a transparent globular element interposed in the system at some point between a suction nozzle and a source of suction, but whereas in the said prior applications rotatable diaphragms are preferably employed, according to the embodiments of the invention herein disclosed the diaphragm is adapted to be mounted in relatively fixed position with reference to the globular elements as suggested in the modification in the invention illustrated in Fig. 7 of my co-pending application Ser. No. 412,861. A damper or valve may be associated with the diaphragm for the purpose of by-passing heavy dirt and the like.

According to the disclosure of the present application the globular element is preferably formed in two hemispheres or bowl shaped members, one of which is associated with a coupling member or fitting, which is itself formed in two axially divided halves. The other hemisphere forms the cover portion of the globular element which is adapted to be detachably connected to the member carried by the pipe coupling, with the diaphragm supported in fixed relation between the two bowl shaped members. The diaphragm may be cut away at a suitable location to accommodate a valve or damper element, preferably supported in the lower bowl member intermediate the inlet and outlet openings of said coupling.

The invention will be more readily understood by reference to the accompanying drawings in which are set forth illustrative embodiments of the invention.

In the drawings:

Fig. 1 is a top view of the combined lower bowl shaped member and pipe coupling.

Fig. 2 is a side elevation of the same.

Fig. 3 is a view showing one-half of the combined pipe coupling and lower bowl member.

Fig. 4 is an edge view of the combined deflector and screen diaphragm element.

Fig. 5 is a side view of the same.

Fig. 6 is a cross section of the dome or transparent cover which is adapted to be secured to the lower bowl member to enclose the diaphragm referred to.

Fig. 7 illustrates the coupling element, with the diaphragm set into a groove in the bowl thereof in position to receive the cover.

Fig. 8 is a side elevation showing the assembled parts.

Figs. 9 and 10 are diagrammatic views illustrating the application of the indicator to the straight part of a cleaning system, whether the same is on the handle of the machine to be moved about or on the handle of a suction pipe carrying the cleaning tool where an extension hose pipe is used.

Fig. 11 is a side elevation of the upper bowl member, dome or cover of a modification of the globular element, in which modification the diaphragm is secured to the cover.

Fig. 12 is an end view of the same.

Fig. 13 is a side view with one-half of the combined coupling and bowl of the modified form, showing a damper element in connection therewith.

Fig. 14 is a top view of the complete bowl equipped with the damper of Fig. 13 turnable to by-pass dirt, and

Fig. 15 is a side view of the assembly of the modified indicator.

Referring particularly to Figs. 9 and 10, A indicates a globular indicator which may be formed of any suitable transparent material such as Celluloid or one of the newer transparent plastics, such as vinyl or acrylic acid esters. The globular element is provided with an inlet portion communicating with a suction pipe B having a suitable floor tool C at one end thereof. The outlet portion of the indicator communicates with a flexible tube D which in turn is connected with a combined dust filter and suction producing means E which may be of the type shown in some of my prior patents, as for example in Patent No. 2,175,644 dated October 10, 1939, or any other suitable source of suction may be employed. The suction pipe B may be used in the extended position shown in Fig. 9 or may be attached to the body of the element E as illustrated in Fig. 10.

Referring particularly to the form of indicating device shown in Figs. 1 to 8 inclusive, the globular member A is formed of two halves, hemispheres or bowls 10 and 11. As previously stated these members are formed of transparent material such as Celluloid or the newer plastics and are adapted to be cast in the form shown in the drawings.

The lower member 10 is bowl shaped and is provided with an inlet pipe 12 shown as communicating with the suction pipe B in Fig. 9, and with an outlet pipe 13 adapted to be placed in communication with a flexible hose pipe D as shown in Figs. 9 and 10.

The members 10, 12 and 13 are themselves formed in two halves or castings 14 and 15, divided axially, and each half including a portion of the bowl 10 and of the inlet and outlet pipes

12 and 13. These halves 14 and 15 are suitably secured together with a fluid tight fit, with the aid, if desired, of fastening devices indicated at 16—16. The halves may be fused together, if desired, where fusible material is employed. Each half of the bowl 10 includes one half of the groove 17, as best illustrated in Figs. 1 and 3, which groove lies in a plane diagonally intersecting the plane in which the halves of the bowl and of the inlet and outlet pipes are joined. The grooves may be formed by pressing the material outwardly thus providing an external rib 18 corresponding to the internal groove. The bowl 10 is shown as threaded at 19 to receive the cover 11 which is threaded at 20. It will be noted that the cover member 11 is smooth and no groove is necessary in this portion of the globular element.

The groove 17 in the lower bowl member 10 serves to locate the diaphragm 21, which may be similar to the diaphragms disclosed in my Patent No. 2,293,290 and in my application Ser. No. 412,861. The diaphragm includes an outer deflector portion or ring 22 having a central opening protected by a screen 23. The diaphragm illustrated in the present form of the device is positioned within the groove in the bowl 10 as best illustrated in Fig. 7, after which the cover member 11 may be screwed onto the bowl member of the assembly as illustrated in Fig. 8.

The operation of the apparatus will be apparent from the foregoing description. As dust laden air is drawn into the globular element through the inlet pipe 12 it is first deflected about the periphery of the indicator by the solid outer portion 22 of the diaphragm and is finally drawn through the central opening to the outlet pipe 13. Any large articles of value such as jewelry or the like will be stopped by the screen 23 and may be removed by simply unscrewing the cover 11, thus allowing access to the interior of the lower bowl member 10.

In the modification shown in Figs. 11 to 15 inclusive the bowl is indicated at 10a and the cover at 11a. The bowl is provided with inclined inlet and outlet pipes 12a and 13a and is preferably formed in two halves 14a and 15a having securing means 16a. The cover member 11a carries the diaphragm member 22a, the central opening of which is provided with a screen 23a. The diaphragm 22a may be secured in a cover of any suitable material and the cover may, if desired, be provided with a groove similar to the groove 17 shown in the bowl member of the previous described embodiment of the invention. Such groove is not essential, however. The diaphragm may be cut away at 32 to allow for a valve or damper 35 with which the bowl 10a is equipped. The cover 11a carrying with it the diaphragm 22a is adapted to be assembled with the bowl 10a as indicated in Fig. 15, with a flange 23 at the lower extremity of the cover slidingly fitting over the upper portion 34 of the bowl member.

The damper 35 may be provided with a stem 36 which passes through an opening in the bottom of the bowl and is provided with an operating knob 37, which may be of rubber or the like and which is adapted to form a fluid tight seal similar to that described in connection with the knobs 18 and 19 in my application Ser. No. 411,931. Pairs of stops 38—38 and 39—39 are provided within the bowl 10a to limit the rotation of the damper or valve 35. When the diaphragm 22a is in position it will extend diagonally across the plane of juncture between the two halves 14a

and 15a of the bowl 10a and in normal operation the damper 35 will occupy the space 32 in the rim of the diaphragm 22a as indicated in the full line position in Fig. 14. The damper is rotatable to the dotted line position when it is desired to by-pass heavy dirt which may have accumulated within the bowl.

The entire indicator including the bowl 10a, cover 11a and inlet and outlet pipes 12a and 13a may be and preferably are composed of suitable transparent material capable of being molded, cast or pressed into the shapes herein disclosed as described in the first embodiment of the invention. The outer rim of the diaphragm may also be composed of transparent material such as Celuloid or the like.

The invention has been described in detail for the purpose of illustration, but it will be obvious that numerous variations and modifications may be resorted to without departing from the spirit of the invention.

What I claim is:

1. A dust indicator for a suction cleaning system, comprising a globular element having a concave transparent interior wall portion, and having an inlet for dust laden air and an air outlet, and deflecting means located between the inlet and outlet for directing entering dust laden air against the concave interior of the globular wall and for producing a whirling movement of the air and dust prior to passage to the outlet, said deflecting means comprising an imperforate ring non-rotatably fixed within the globular element and so inclined with reference to the air inlet that the entering air impinges angularly upon the ring and the dust contained therein is directed against the curved interior wall, said ring having a central opening to allow passage of air to the outlet opening, said globular element being composed of two halves, one being bowl shaped and carrying an inlet and an outlet pipe, and the other constituting the cover for the bowl member.

2. In a suction cleaning system, a transparent dust indicator comprising a bowl member having inlet and outlet pipes, a cover member for said bowl, and means for directing dust laden air against the curved interior wall of the indicator comprising an imperforate deflecting ring positioned diagonally with reference to the inlet and outlet openings thereof.

3. In a suction cleaning system a dust indicator comprising a transparent globular element formed of two halves, one member comprising a bowl having inlet and outlet pipes, and the other member comprising a cover for said bowl, and a diaphragm carried by one of said members extending diagonally between the inlet and outlet of said indicator.

4. An indicator as set forth in claim 3 wherein the bowl member is formed of two halves joined in a plane which includes the central axes of the inlet and outlet pipes.

5. An indicator as set forth in claim 3 wherein the diaphragm is carried by the bowl member.

6. An indicator as set forth in claim 3 wherein the diaphragm is carried by the cover member.

7. An indicator as set forth in claim 3 wherein the diaphragm is carried by the cover member and is provided with a cut away portion to accommodate a damper, said damper being carried by the bowl member, and means for rotating said damper to by-pass heavy dirt.

DANIEL BENSON REPLOGLE