(No Model.) 2 Sheets—Sheet 1.

E. A. POND.

APPARATUS FOR SPRAYING, &c.

No. 307,330. Patented Oct. 28, 1884.

FIG. 1.

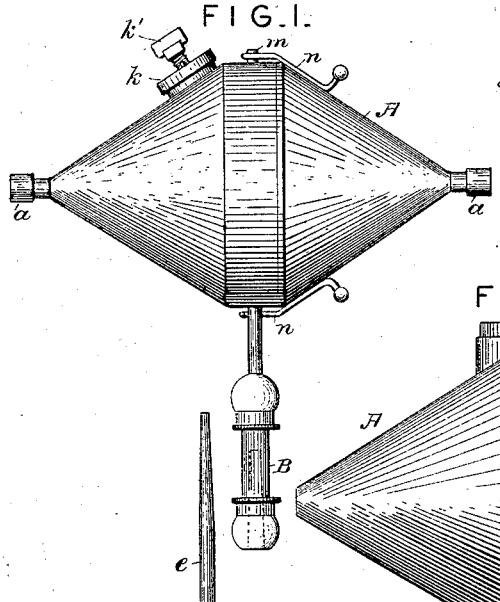


FIG. 2.

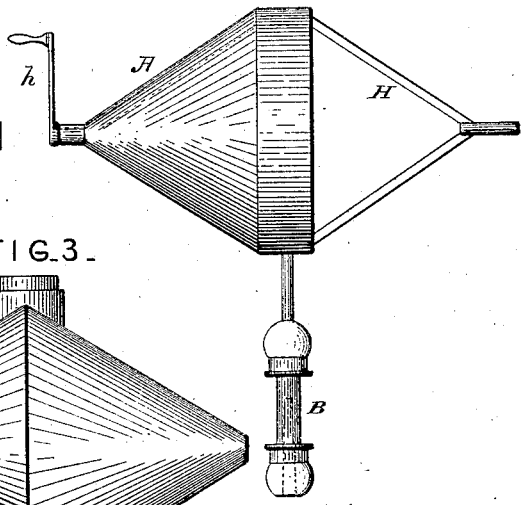


FIG. 3.

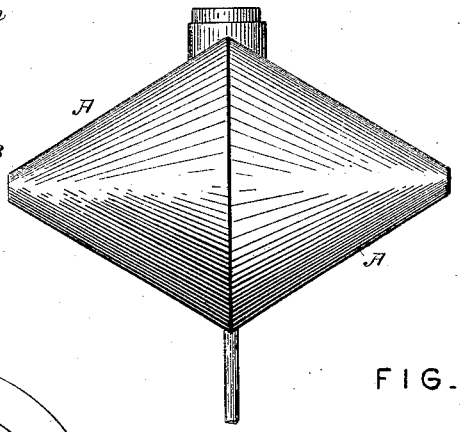


FIG. 4.

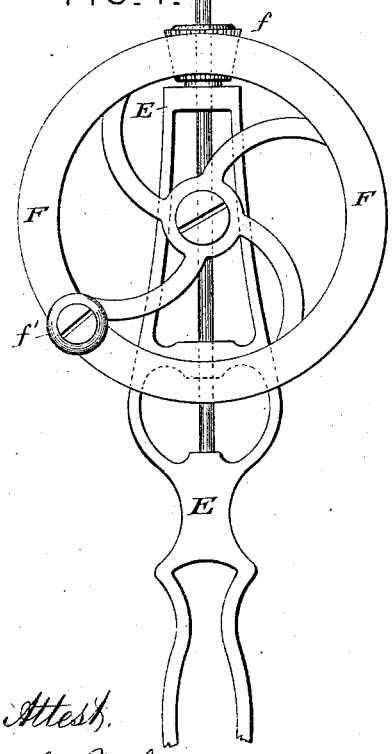
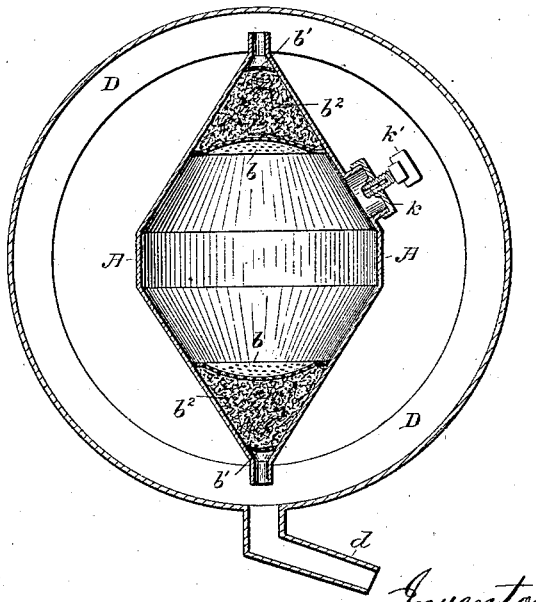


FIG. 5.



Attest.
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C. J. Hedrick

Inventor.
Erasmus A. Pond
by A. Pollock
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(No Model.) 2 Sheets—Sheet 2.

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FIG. 6.

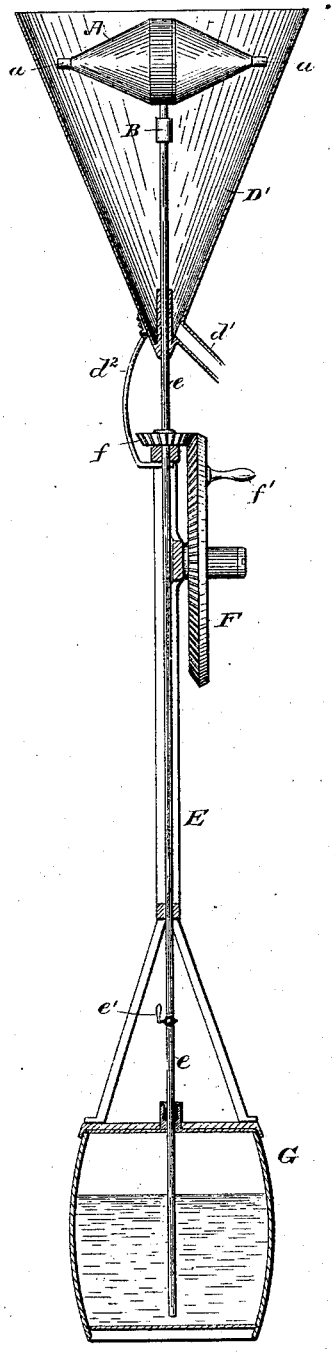


FIG. 7.

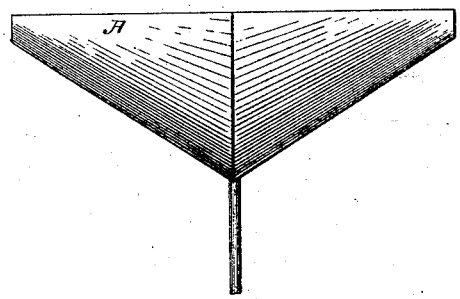


FIG. 8.

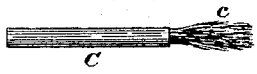


FIG. 9.

FIG. 10.

FIG. 11.

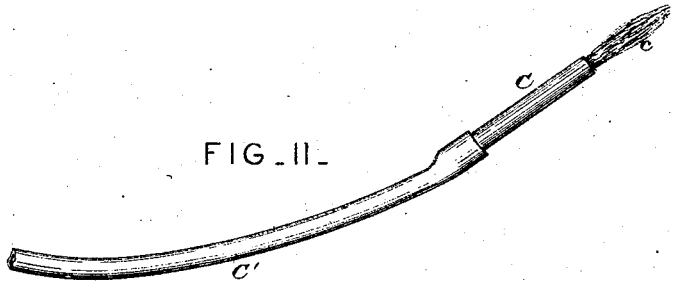


FIG. 12.

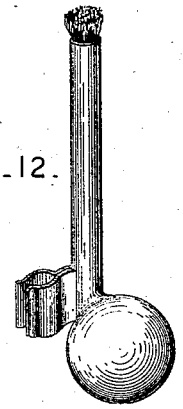
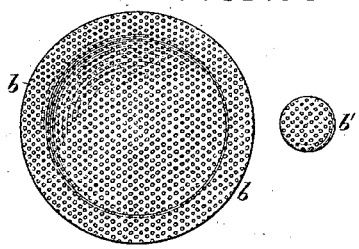


FIG. 13.



Attest { Geo. T. Smallwood. C. J. Hedrick

Inventor. Erasmus A. Pond by A. Pollok his attorney

UNITED STATES PATENT OFFICE.

ERASMUS A. POND, OF RUTLAND, VERMONT.

APPARATUS FOR SPRAYING, &c.

SPECIFICATION forming part of Letters Patent No. 307,330, dated October 28, 1884.

Application filed June 23, 1884. (No model.)

To all whom it may concern:

Be it known that I, ERASMUS A. POND, of Rutland, in the county of Rutland and State of Vermont, have invented a new and useful Improvement in Apparatus for Mixing, Digesting, Spraying, and similar purposes, which improvement is fully set forth in the following specification.

In my Patent No. 297,002, dated April 15, 1884, I have described an apparatus for mixing, digesting, and similar purposes, consisting of a box or receptacle of rhombic, double conical, or similar form, adapted to be rotated in such way that the corners or points farthest from the axis turn always in the same plane.

The present invention comprises certain improvements in the apparatus aforesaid, whereby better results are accomplished and its uses extended.

For the purposes of this invention I prefer to employ the double-conical form of box, or in some cases a simple tube journaled at points equidistant from the ends will answer well. The box may be made in one piece, with a convenient opening for filling; or it may be made in two halves, fastened by hooks, clamps, or similar devices. When the present device is used for spraying disinfectants and similar liquids, for which it is well adapted, small apertures are left at each end of the receptacle, through which the fluid may pass. When the receptacle is rotated, the points or ends where the openings are made move with considerable speed, displacing the air and producing a partial vacuum in the vicinity of the openings. This, aided by the centrifugal force of the apparatus, forces the fluid out of the openings. To insure a fine spray, the latter are provided with suitable nozzles packed with a capillary mass, such as sponge, camel's hair, &c. In order to reach the ceilings of rooms or to throw the spray to great distances, flexible extension-tubes are attached to the ends of the receptacle. This fibrous medium serves also to filter the material passing through it, and the filtering action may be greatly increased by filling the ends of the cones with filtering media packed between perforated diaphragms. In this connection a funnel-shaped receptacle or suitable trough is used to collect the liquid discharged by the nozzles. The same apparatus is available for digesting medicines and similar purposes.

As a mixer, the improved apparatus is used as explained in my aforesaid patent, the openings being closed by caps provided for that purpose. Where dry powders are to be operated upon, a scraper to clear the sides of the vessel is used. It consists of a frame having bearings in the opposite ends of the cones, and can be turned by a suitable handle. The device may be rotated by hand or power. When used for industrial purposes on a large scale, any number of receptacles can be connected and operated together.

In the accompanying drawings, which form a part of this specification, Figure 1 is an elevation of the double-conical rotatable device; Fig. 2, a similar view of one of the halves of the same, exposing the scraper; Fig. 3, a similar view of a somewhat different form of receptacle; Fig. 4, an elevation of a contrivance for imparting the rotary motion; Fig. 5, a view in section of the device in connection with a trough for catching the liquid discharged; Fig. 6, a vertical section showing the receptacle connected with an extra reservoir through the hollow spindle of the rotating apparatus; Fig. 7, an elevation of another form of rotatable receptacle, and Figs. 8, 9, 10, 11, 12, and 13 views of various attachments for use in connection with the device.

The receptacle A in Fig. 1 consists of two cones and an intermediate cylindrical part. This intermediate portion may be of cubical or other shape, or the vessel A may be composed simply of two cones placed base to base, as shown in Fig. 3. At the apices of the cones are openings provided with caps *a*, for closing, when desired. Midway between the extremities of the cones is a short handle, B, upon which the device turns as an axis. This handle is hollow, enabling it to fit upon the spindle *e* of the rotating apparatus, Fig. 4.

As shown in Fig. 1, the vessel is made in two halves, fitted together and held by hooks *n*, engaging one with the handle B, the other with a stud, *m*. It has an opening for filling purposes normally closed by a cap, *k*.

Within the receptacle A is or may be placed a scraper, H, (see Fig. 2,) consisting of a quadrilateral frame with short hollow journals entering the nozzles of the cones.

To operate the scraper, remove one of caps *a*, fit the handle *h* in the hollow journal of scraper H, and turn the same.

For spraying and like purposes, the openings in the ends of the cones may be plain and have fibrous material—such as wool or sponge—stuffed therein; or the nozzles C, which may be straight, curved, flaring, or other shape, may be inserted in said openings, the caps *a* being of course removed. These nozzles are loosely filled with a capillary mass, *c*, which may be camel's-hair, Fig. 8, sponge, Fig. 9, woolen fiber, Fig. 10, or other suitable material. The liquid being forced through this packing *c* would be discharged in a fine spray. For very volatile substances a small nozzle without packing would answer.

For throwing a spray, as of a disinfectant, extension-tubes C'—say of rubber—are fitted to the ends of the cones. Such tube is shown in Fig. 11.

For sifting dry materials, a sieve-like diaphragm, *b'*, Fig. 13, is placed over the opening in each cone.

To diffuse through the air substances not very volatile, a certain amount of heat is necessary, which is done by attaching to the handle of the instrument a tube, such as shown in Fig. 12, which holds the wick of an alcohol-lamp or other heater. The fibrous packing *c* serves also to filter the liquid passing through it; but for this purpose a greater amount of filtering material is desirable. It may be placed in the ends of the cones between porous diaphragms, as shown in the sectional view, Fig. 5, the diaphragms being lettered *b b'* and the fibrous packing b^2. The liquid as it escapes through the orifices is caught in the trough-like ring D, which may be supported in any suitable way, and is provided with a spout, *d*, for carrying off the filtered liquid.

For corrosive substances, the vessels A and D should be provided with a non-corrodible lining, and the packing b^2 should be of indestructible substance—such as spun glass, asbestus, &c. The rotating device A has a cap, *k*, to be removed for filling, and in the center of this cap is a screw, *k'*, which answers as a handle to remove the cap. The screw is split or slotted, as shown, and when unscrewed to the proper distance air can be admitted to the receptacle as its contents are discharged.

In Fig. 4 is shown a device for imparting a rotary movement to the receptacle A. It consists of a frame, E, in bearings of which is a rotary spindle, *e*. The latter has fixed thereon a pinion, *f*, meshing with a large gear, F, turning on a short shaft projecting from frame E. The wheel F has a handle, *f'*, for turning. The relative sizes of the wheels *f* and F can be varied according to the speed at which it is desired to rotate the vessel A. The latter is fitted on the spindle *e* by inserting the end of said spindle in the hollow of handle B. This device is shown by way of example only, it being obvious that the movement may be imparted by any suitable means. The rotation need not be continuous in one direction, but may be first in one direction and then in the other.

When used in the open air to spray water or scatter seeds, the device A could be connected so as to receive its motion from the wheels of the wagon on which it is carried; or it may be operated in some cases by clock-work—as, for instance, to diffuse a disinfectant—such as carbolic-acid solution—in a sick-room.

It is often desirable, for the purpose of avoiding repeated fillings of the vessel A, to connect the same with an extra reservoir, from which a constant supply may be obtained. This can be done as shown in Fig. 6. The spindle *e* of the rotating apparatus, as well as the handle B of vessel A, is hollow. The former extends downward into a reservoir, G, at the bottom of frame E. As the receptacle A revolves and its contents are discharged, (the air-valve being closed,) a vacuum is produced therein which draws up the liquid from reservoir G. A suitable stop-cock, *e'*, to check this flow may be provided, and the reservoir G may in turn be connected with one of larger size. In this figure a funnel-shaped vessel, D', is provided to catch the discharge from the rotating receptacle. The spindle *e* passes up through an opening in the bottom of vessel D', which is fastened to the frame E by a hook, d^2, to prevent rotation of the vessel D' with the spindle. A spout, *d'*, carries off the liquid collected in vessel D'.

For digesting medicines the operation is similar to filtering. The receptacle being supplied with the medicines and the menstruum (alcohol or water) poured in and allowed to stand until sufficiently impregnated, the apparatus is rotated, and new menstruum added from time to time.

In druggists' uses, for the mixing and laying out of powders, as sedlitz, &c., put the materials into the receptacle and rotate them until properly mixed, then open the nozzles and turn slowly with the axis of rotation horizontal. A definite quantity of powder, depending on the size of the nozzles and speed of rotation, is ejected at each half-turn of the machine. Bromine or other strong vapors in solution or mixed with lime can be placed in a glass receptacle, the extremities packed with fine-spun glass, asbestus, &c., allowing only a small definite flow of vapor. The receptacle may be suspended in the sick-room or over a bed, and occasional motion may be imparted to it by hand.

For scattering seeds and powders, a receptacle having plain openings without nozzles, such as shown in Fig. 3, is preferred, such receptacle being about half filled and rotated horizontally or in an inclined position; or, for

this purpose, the receptacle may be in the form of a half-section longitudinally of the double-cone vessel. Such a receptacle is shown in Fig. 7.

In using the device as a washer and wringer, the articles are put in with the soap and water, the caps placed over the openings, and the vessel rotated until the articles are thoroughly cleansed, then the caps are taken off and clean water for rinsing admitted through the filling-aperture. The receptacle is then again rotated at high speed with the nozzles open until the articles are sufficiently dry.

It will be noticed that in revolving this device, having an opening only at each end, a powerful suction is produced, increased by the shape of the receptacle, which throws all particles to the center, giving greater power to the centrifugal force.

It is obvious that the details of the invention are susceptible of variation and modification within wide limits without involving a departure from the spirit of the invention, that the invention is applicable to other purposes than those expressly mentioned, and that parts thereof may be used separately.

Having now fully described my said invention and the manner of carrying the same into effect, what I claim is—

1. The rotatory receptacle of double-conical or similar shape, having openings at the points farthest from the axis of rotation, and caps for closing the same, substantially as described.

2. The combination, with the rotatory receptacle having openings at the extremities, of the fibrous or capillary mass at each end of said receptacle, substantially as described.

3. The combination, with the rotatory receptacle having openings at its extremities, of the attachable and detachable nozzles of any suitable shape, substantially as described.

4. The combination, with the rotatory receptacle having openings at its extremities, of the nozzles containing sponge, hair, or similar material, substantially as described.

5. The combination, with the rotatory receptacle having openings at the extremities, of the perforated or sieve-like diaphragms, substantially as described.

6. The rotatory receptacle with open extremities provided at each end with filtering media held between perforated diaphragms.

7. The combination, with the rotatory receptacle having open ends, of the extension-tubes, substantially as described.

8. The combination of the rotatory receptacle having open ends and the trough or vessel for catching the liquid discharged from the openings, substantially as described.

9. The combination of the rotatory receptacle having open ends and the wick-tube, substantially as described.

10. The combination of the receptacle of double-conical shape and the rotatable scraper, substantially as described.

11. The rotatory receptacle having openings in the extremities farthest from the axis of rotation and provided with an air-valve, substantially as described.

12. The combination of the receptacle shaped like a double cone, and having openings in the apices of the cones, the hollow spindle upon which the same revolves, means for rotating said spindle, and an extra reservoir connected with said receptacle through said spindle, substantially as described.

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

ERASMUS A. POND.

Witnesses:
MAUD RADDIN,
ADELA M. POND.