

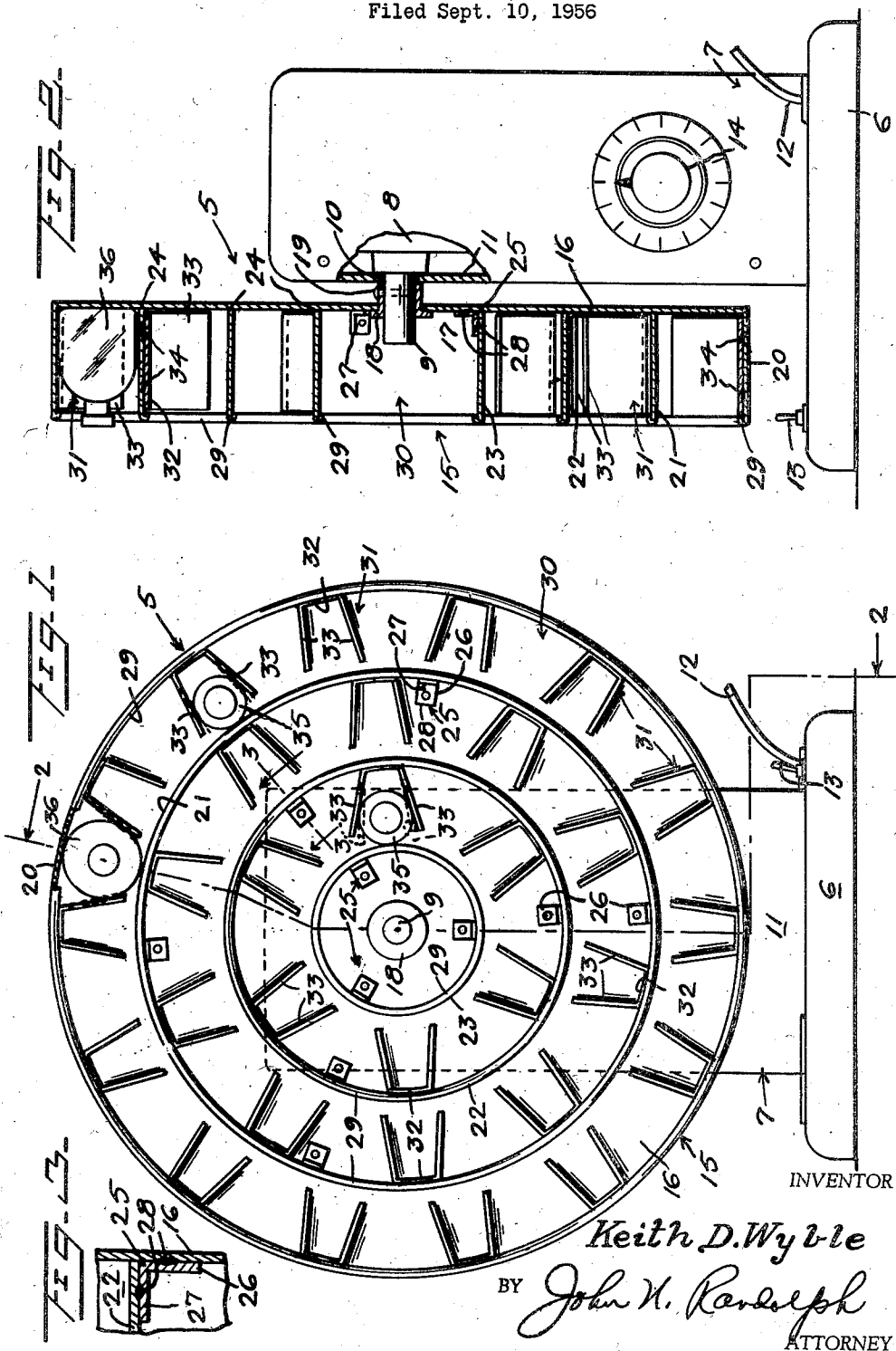
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CENTRIFUGE

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CENTRIFUGE

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5 Claims. (Cl. 233—26)

This invention relates to a centrifuge primarily adapted for use in laboratory work and elsewhere in connection with making various tests of contents of containers requiring separation by centrifugal force of the ingredients or components.

One primary object of the invention, in connection with a laboratory use thereof, is to provide a centrifuge especially adaptable for use for accelerating the diffusion of a gas from a liquid, constituting contents of a container supported by the centrifuge, so that the gas can then be absorbed by a chemical solution, within the container, and thereafter measured quantitatively.

More particularly, it is an aim of the present invention to provide a centrifuge which is primarily adapted to be operated at a low speed and which is so constructed that a number of containers, the contents of which have to be subjected to separation by centrifugal force, may be simultaneously accommodated in the device, including container of different sizes and shapes.

Various other objects and advantages of the invention will hereinafter become more fully apparent from the following description of the drawing, illustrating a presently preferred embodiment thereof, and wherein:

Figure 1 is a front elevational view of a centrifuge, constructed in accordance with the invention;

Figure 2 is a vertical sectional view, partly in elevation thereof, taken substantially along a plane as indicated by the line 2—2 of Figure 1, and

Figure 3 is an enlarged fragmentary radial sectional view, taken substantially along a plane as indicated by the line 3—3 of Figure 1.

Referring more specifically to the drawing, the centrifuge in its entirety is designated generally 5 and constitutes a small, relatively light and portable machine including a base 6 which may rest upon a table or any other suitable supporting surface. A housing 7 is fixed to and extends upwardly from a rear portion of the base 6. A power source such as small electric motor 8 is mounted in and supported by the upper portion of the housing 7 and has an armature shaft 9 extending therefrom loosely through an opening 10 in a front wall 11 of the housing 7. Electric current is supplied to the motor 8 from a suitable source, not shown, such as a domestic outlet, through an electric cord a part of which extends from the base 6, as seen at 12. A switch 13 is mounted on the base 6 and is interposed in the circuit of the electric cord 12 for making and breaking the electric circuit to the motor 8, when the cord 12 is connected to a source of electric current. The electric motor 8 is of the variable speed type and a suitable control 14, which is interposed in the electric circuit of the motor 8, is mounted on the housing 7 and is manually operable for regulating the speed at which the armature shaft 9 is revolved when the motor 8 is energized.

The centrifuge 5 also includes a novel rack or holder, designated generally 15, which is preferably of circular shape and which includes a substantially flat circular back wall 16 having a central opening 17 in which a hub 18

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is fixed. The end of the armature shaft 9 which projects from the front housing wall 11 extends through and fits in the hub 18 and is secured thereto by a fastening 19 so that the rack or holder 15 will revolve with said shaft 9. The shaft 9 also supports the rack or holder 15 in front of and spaced slightly from the housing front wall 11 and in a vertical plane directly above a front portion of the base 6.

The rack or holder 15 includes an outer annular wall 20 which projects forwardly from the periphery of the rear wall 16 and which may be formed integral therewith, as illustrated. The rack or holder 15 also includes a plurality of additional annular walls, preferably the three walls 21, 22 and 23 which are concentrically disposed relative to one another and to the outer wall 20 and in radially spaced relation to one another and to said wall 20. The back plate 16 and the walls 20, 21, 22 and 23 are preferably formed of metal. Said walls 21, 22 and 23 have rear edges abutting against the inner or forward side of the rear wall or back plate 16, as seen at 24. Each of the walls 21, 22 and 23 is secured to the rear wall 16 by a plurality of angle brackets 25 each having a leg 26 which is disposed against and secured to the inner or front side of the rear wall 16, and a leg 27 which projects forwardly therefrom and which is disposed at a right angle thereto. The legs 27 are secured to the inner surfaces of the annular walls 21, 22 and 23. Said angular brackets 25 are preferably secured by spot welding, as seen at 28 in Figures 1 and 3, to the rear wall 16 and the annular walls 21, 22 and 23. The annular walls 20, 21, 22 and 23 have rolled front edges 29 which define the open front 30 of the rack or holder 15, as seen in Figure 1. Said rolled edges 29 will protect the user from injury in the event that a hand should come in contact with the front of the rack 15 while it is revolving and will also protect against the open front of the rack cutting, tearing or otherwise damaging any article which might come in contact therewith while the centrifuge is in operation.

Each of the annular walls 20, 21 and 22 carries a plurality of spring clips 31, as best seen in Figure 1, each of which comprises an intermediate or bight portion 32 and a pair of legs 33 which extend in diverging relation to one another from the ends of the bight portion 32. The spring clips 31 are spaced inwardly from the open front 30 of the rack 15, as defined by the rolled edges 29 of the annular walls. The bight portions 32 of the clips 31 are disposed against and secured as by spot welding, as seen at 34 in Figure 2, to the inner sides of the rings 20, 21 and 22 so that the legs 33 of each clip 31 extend inwardly from the annular wall on which said clip is mounted. The legs 33 are of a length so that their inner free ends are spaced from the next innermost annular wall and are disposed in circumferentially spaced relation to one another. Likewise, the clips 31 are circumferentially spaced from one another a distance preferably greater than the spacing between the legs 33 of each clip. The legs 33 are resilient and are capable of yielding toward or away from one another relative to their normal diverging disposition.

The individual spring clips 31 are adapted to support containers such as the bottles 35 between the legs 33 thereof, which are spread somewhat as seen in full and dotted lines in Figure 1 to accommodate said containers 35, and so that each container 35 will be resiliently gripped between the two legs 33 of a clip 31 and a portion of the exterior of the annular wall which is inwardly disposed with respect to said clip and which is located adjacent the free ends of the clip legs 33. The rack or holder 15 is also adapted to yieldably hold larger containers or bottles 36 which are disposed between two of the annular walls and which are yieldably gripped between adjacent

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legs 33 of two adjacent clips 31 and a portion of the wall on which said two clips are mounted, as seen in Figure 1. The annular walls 21, 22 and 23 are each connected to the rear wall 16 at only a plurality of circumferentially spaced points so that said walls 21, 22 and 23 will be yieldably supported by the brackets 25 to have a slight yielding or flexing movement relative to one another and to the outer wall 20. Accordingly, the brackets 25 and said walls 21, 22 and 23 are formed of a resilient material to provide the desired resiliency.

From the foregoing it will be apparent that the motor 8 can be energized for turning the shaft 9 and the rack or holder 15, which constitutes a centrifuge, at a selected R. P. M. and for a desired time interval to effect separation by centrifugal force of the components of the contents of the containers 35 and 36. It will also be apparent that a large number of containers 35 and 36 may be simultaneously supported by the centrifuge and subjected to centrifugal force thereby.

Various modifications and changes are contemplated and may be resorted to without departing from the function or scope of the invention as hereinafter defined by the appended claims.

I claim as my invention:

1. A centrifuge comprising a rotatably driven shaft, and a rack having a central portion fixed to said shaft and supported thereby for rotation therewith, said rack including a rear wall and a plurality of radially spaced concentric annular walls fixed to and extending from a forward side of said rear wall and having front edges defining the open front of the rack, and resilient means disposed between said annular walls and supported by certain of said annular walls and adapted to cooperate with the

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annular walls for supporting a plurality of containers within said rack for rotation therewith.

2. A centrifuge as in claim 1, each of said resilient means comprising a spring clip having an intermediate portion secured to an inner side of one of the annular walls and a pair of resilient legs extending inwardly therefrom and having inner free ends spaced from an adjacent annular wall.

3. A centrifuge as in claim 1, and means connecting certain of said annular walls at a plurality of circumferentially spaced points to said rear wall and forming a resilient mounting for said annular walls for yielding movement thereof toward and away from one another whereby said annular walls are adapted to cooperate with said resilient means to yieldably grip containers therebetween.

4. A centrifuge as in claim 3, each of said yieldably supported annular walls being formed of a resilient material.

5. A centrifuge as in claim 4, each of said resilient means comprising a spring clip having an intermediate portion secured to an inner side of one of the annular walls and a pair of resilient legs extending inwardly therefrom and having inner free ends spaced from an adjacent annular wall.

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