March 13, 1934. G. J. STREZYNSKI 1,950,868

CENTRIFUGAL BOWL

Filed June 25, 1931

FIG. 1.

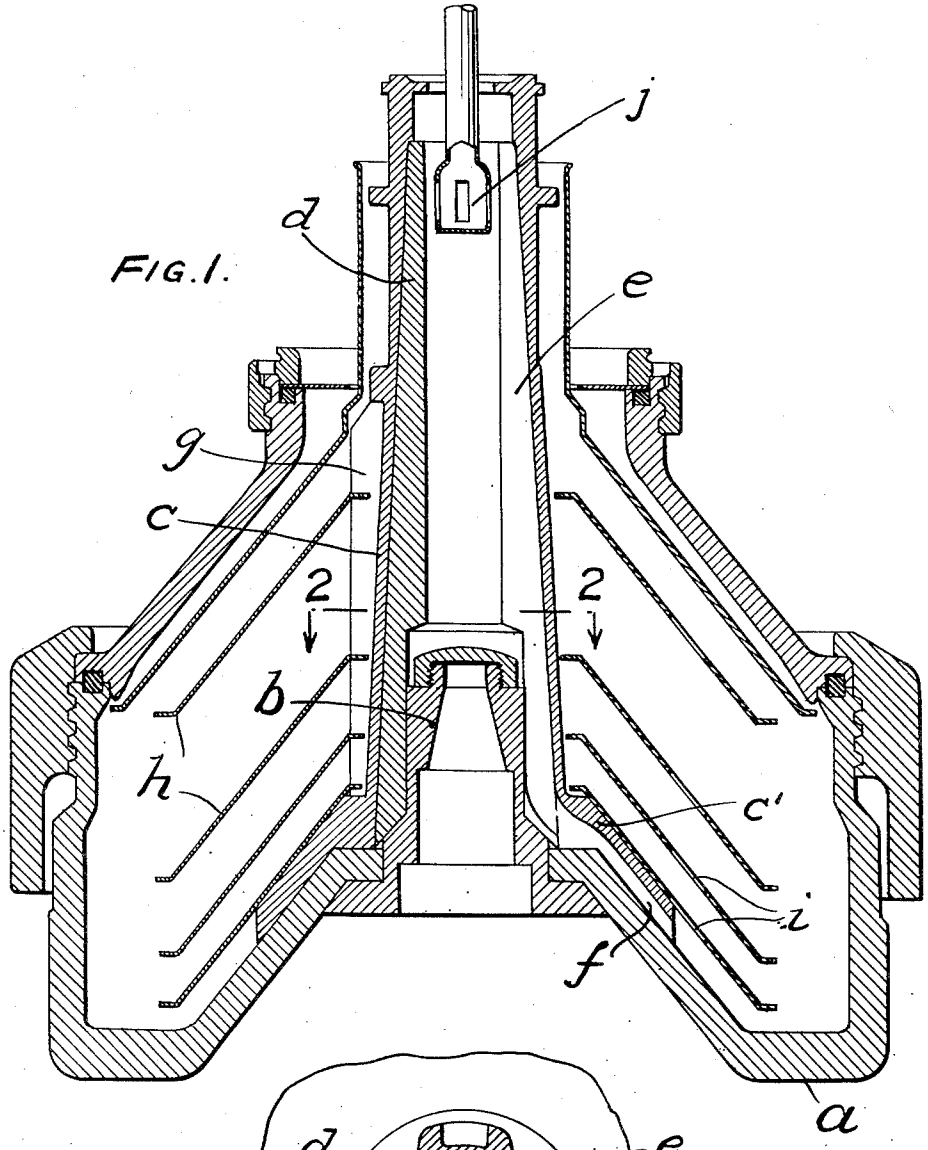
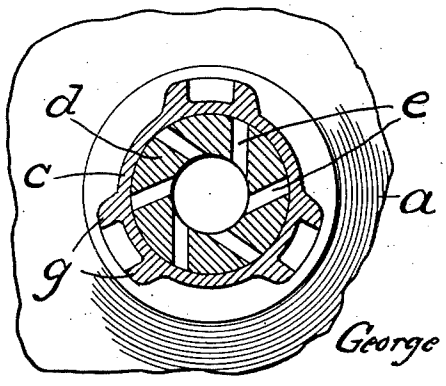


FIG. 2.



WITNESS:

INVENTOR

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ATTORNEYS.

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CENTRIFUGAL BOWL

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Application June 25, 1931, Serial No. 546,757

10 Claims. (Cl. 233—27)

My invention is an improvement in centrifugal separating bowls.

The objects of my invention are: the reduction to a minimum of the emulsification that occurs when liquids from the stationary feeding tube strike the rapidly revolving walls of the receiving chamber of the bowl; more uniform distribution of liquid about the circle of the bowl; easier cleaning of the parts of the bowl; and increased pumping effect with same discharge diameter.

Most modern centrifugal bowls have, projecting up in the center, a top closed tube, called a nave, adapted to fit around and rest on the top of the spindle that supports and drives the bowl. Surrounding the nave and spaced from it is another tubular member, called a tubular shaft, having on the outside, ribs to guide and support the frusto-conical devices, technically called discs, which divide the liquid in the main part of the bowl into thin layers and, on the inside, two or more ribs to catch and accelerate the liquid entering the bowl. Centrifugal bowls having this construction are disclosed in many issued patents, for example, in the Lindgren Patent No. 1,749,291.

It is common practice to make these tubular shafts of cast material which, as the interior shape is such as to be impossible to machine, is rough and difficult to keep clean. The usual three or four ribs violently whip the entering liquid, causing emulsification, and then throw it out into the bowl in three or four concentrated streams, causing, between the discs, a number of sectors of rapid flow between which are sectors of relatively slow flow.

In order to properly centrifuge all of the liquid passing through the bowl it is necessary that the flow shall be slow enough to provide adequate time for the liquid moving at the maximum speed. As a result of this the liquid remains much longer than necessary in the sectors of slow flow and the capacity of the bowl is thus greatly reduced.

The improvement embodying my invention effects a much more even distribution of liquid around the bowl, with resultant increase of bowl capacity, and emulsification is reduced to a minimum. In constructing my improved bowl, I proceed, preferably, as follows:

The inside of the tubular shaft is bored smooth, preferably somewhat taper, with the larger end at the bottom. Within the shaft is placed a removable squirrel cage with not less than six, and preferably from eight to sixteen, either vertical or long-pitch helicoidal slots, either of which may be defined as vertically extensive, and which may be radial in their transverse extension but are preferably tangential rearwardly with respect to the direction of rotation.. A feed tube with a side outlet should be provided. This squirrel cage takes the liquid from the central space in many thin ribbon-like streams, with a minimum of whipping, and discharges it through corresponding channels under the tubular shaft into the body of the bowl in so many streams that the high and low velocity sectors are comparatively narrow and therefore of comparatively small difference in velocity.

When the squirrel cage is removed, the inside of the tubular shaft is smooth and easily cleaned, and every part of the squirrel cage itself, while out of the bowl, is easily accessible for cleaning.

In the accompanying drawing, which illustrates an embodiment of my invention: Fig. 1 is a vertical section of a bowl and Fig. 2 is a partial horizontal section on the line 2—2 of Fig. 1.

The bowl shell *a* has a hollow nave *b* extending upward from its bottom. Around the nave and inside the tubular shaft *c* is the squirrel cage *d* having slots *e*. The lower ends of the slots *e* communicate with passages *f* under the petticoat *c'* of the tubular shaft. On the outside of the tubular shaft are ribs *g* that guide and support a nest of discs *h*, only a few of which are shown, and through which are distributing holes *i*. *j* is a feed tube with tangential side outlets.

In operation, liquid jetting from the side outlets of the tube *j* is caught in the slots *e* of the squirrel cage, flows down them and through the passages F whence it escapes to the distributing holes *i* and from them to the inter-disc spaces where the separation takes place.

The sharp edges of the bars of the squirrel cage, with a minimum of agitation, whipping and emulsification, smoothly shear off, from the entering stream of liquid, thin layers which are smoothly propelled outward with great pumping effect.

When the squirrel cage is taper, a slight jar loosens it so that it can be readily removed.

Having now fully described my invention, what I claim and desire to protect by Letters Patent:

1. In a centrifugal bowl, the combination with a shell having a central nave and a tubular shaft surrounding and spaced from said nave and having passages thereunder, of a squirrel cage-like member within said shaft and between it and the nave, said member having therethrough a multiplicity of rearwardly extending tangential

slots adapted to each receive a small part of the liquid fed inside said member and discharge it to said passages.

2. In a centrifugal bowl, the combination, with a shell and its nave, of a tubular shaft having a smooth bore, and a removable member adapted to fit around said nave and inside said bore and having a multiplicity of narrow vertically extensive slots cut therethrough.

3. In a centrifugal bowl, the combination with a shell and its nave, of a tubular shaft having a smooth bore, and a removable member adapted to fit around said nave and inside said bore and having a multiplicity of narrow vertically extensive rearwardly tangential slots cut therethrough.

4. In a centrifugal bowl, the combination with a shell and its nave, of a tubular shaft having a smooth bore, and removable taper member adapted to fit around said nave and inside said bore and having a multiplicity of narrow vertically extensive slots cut therethrough.

5. In a centrifugal bowl, the combination with a shell and its nave, of a tubular shaft having a smooth bore, and a removable taper member adapted to fit around said nave and inside said bore and having a multiplicity of narrow vertically extension rearwardly tangential slots cut therethrough.

6. In a centrifugal bowl, the combination with a shell having a central nave and a tubular shaft surrounding and spaced from said nave, of a squirrel cage-like annular member within and contacting with the shaft and between it and the nave, said member having therein a multiplicity of vertically extensive slots which at the outside are closed by the inner wall of the tubular shaft and at the inside open into that part of the tubular shaft which said annular member encloses, the lower end portions of said slots communicating with the interior of the bowl.

7. In a centrifugal bowl, the combination with a shell having a central nave and a tubular shaft surrounding and spaced from said nave, of a squirrel cage-like annular member within and contacting with the shaft and between it and the nave, said member having therein a multiplicity of vertically extensive slots which at the outside are closed by the inner wall of the tubular shaft and at the inside open into that part of the tubular shaft which said annular member encloses, the lower end portions of said slots communicating with the interior of the bowl, said slots in their lateral direction of extension extending tangentially rearward.

8. In a centrifugal bowl, the combination with a shell having a central nave and a tubular shaft surrounding and spaced from said nave and extending substantially above the nave, of an annular member within and contacting with the shaft and whose lower end is confined between the nave and the shaft said member having therein vertically extensive slots which extend laterally completely through said member, the slots at the outside being closed by the inner wall of the tubular shaft and at the inside being, at their lower ends, closed by the nave and, above their lower ends, opening into the open central part of the tubular shaft, the lower portions of said slots communicating with the interior of the bowl.

9. In a centrifugal bowl, the combination with a shell having a central nave and a tubular shaft surrounding and spaced from said nave and extending substantially above the nave, of an annular member within the shaft provided with a multiplicity of vertically extensive passages, the lower part of said annular member extending between the feed tube and the nave, said annular member extending above the nave and enclosing the open central part of the tubular shaft, said passages communicating at their lower ends with the interior of the bowl and closed throughout the greater part of their length at the outside and opening in the upper part of their length at the inside into the open central part of the tubular shaft.

10. In a centrifugal bowl, the combination with a shell having a central nave and a tubular shaft surrounding and spaced from said nave and having passages thereunder, of a removable squirrel cage-like member extending within the shaft between the nave and shaft and substantially above the nave and having formed therein a multiplicity of slots whose lengthwise direction of extension approximates parallelism with the axis of the shaft and which above the nave open laterally into the open space within the tubular shaft enclosed by said member.

GEORGE J. STREZYNSKI.