Sept. 12, 1944. R. S. BLOUGH 2,358,205

AGITATOR

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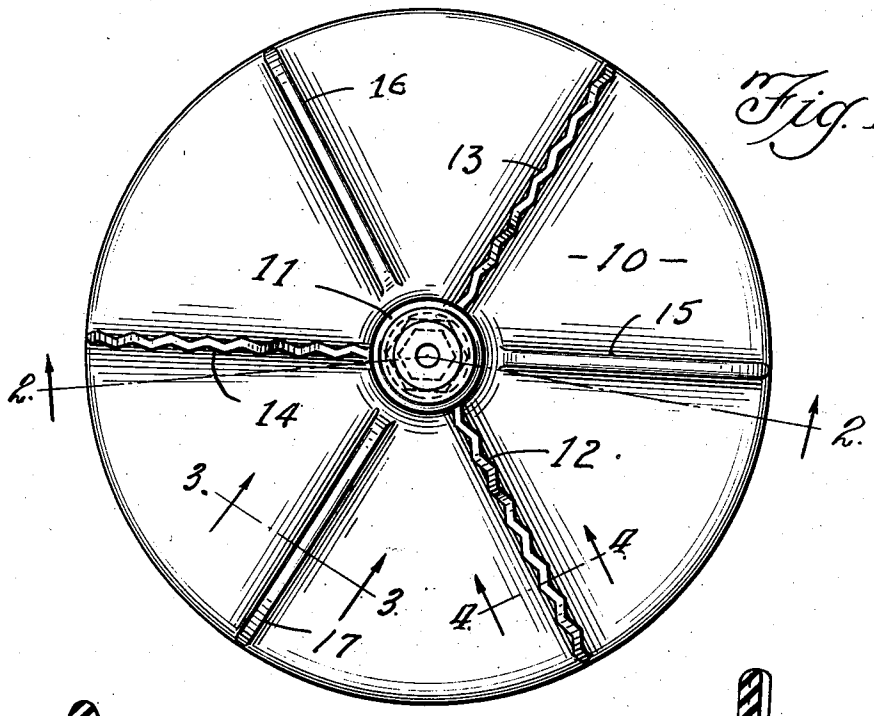


Fig. 1.



Fig. 3.

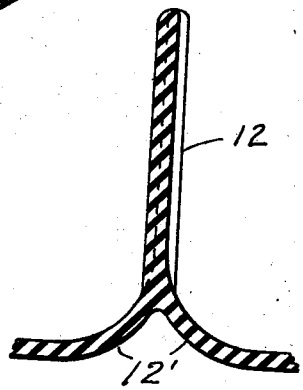


Fig. 4.

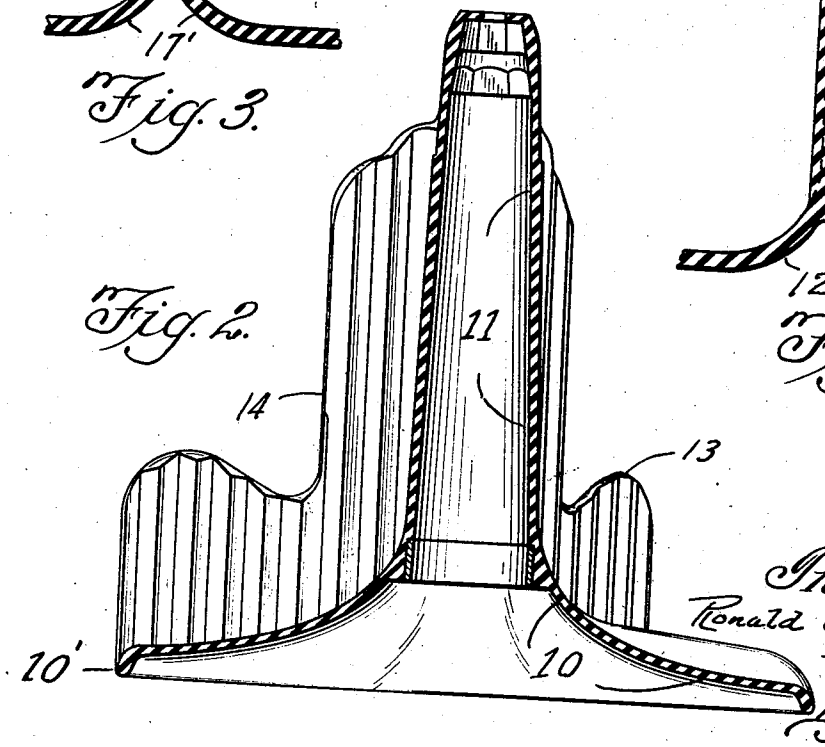


Fig. 2.

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AGITATOR

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2 Claims. (Cl. 68—134)

This invention relates to agitators for domestic washing machines of the general conventional and popular type illustrated in the drawing. Such agitators have commonly been cast in dies from aluminum, it being highly desirable on account of the inertia of the rapidly reciprocating agitator to reduce the weight to the lightest practical point.

Under present war conditions aluminum may be withheld from use for non-essential industries and the washing machine industry is now turning to substitute materials such as phenolic condensation products similar to the well-known Bakelite—and will hereinafter be referred to generically as Bakelite. Such materials are not as strong as aluminum, being particularly breakable by shock. In general, thick sections do not increase the strength in proportion to the weight, therefore the optimum agitator considering all factors including cost, should be light in weight. Further, dies for moulding aluminum agitators are not adaptable for Bakelite because of the great pressure required for Bakelite moulding and the fluidity of such materials under heat and pressure moulding conditions. Whereas, dies made for aluminum agitators are commonly made in three or more parts split along vertical lines of the agitators, dies for Bakelite are better made in two parts with the parting line around the rim of the agitator base. There are many reasons for this: dies made in two parts with a horizontal continuous parting can be made tighter to thus withstand the high pressure fluid Bakelite; next any fins at the partings are immunized by the shorter parting and such fins are confined to a section of the agitator not in contact with the clothes. It must be borne in mind that unlike metallic parts, the surface skin of Bakelite products when unbroken is water-proof, whereas when broken, there is a tendency for the filler material within the body of the section to absorb water, thus causing increased weight, ditsortion and possible failure. It will further be appreciated that the smoother the agitator, the less wear on the clothes.

Aluminum agitators are originally somewhat porous and rough, and become more roughened by the etching of washing fluids and electrolytic action. Although hard on clothes, aluminum agitators are effective in their washing action, which is increased by reason of this surface roughness. Bakelite, on the other hand, is originally very smooth and being an inert material, is not affected by washing solutions and electrolytic action, and thus remains smooth. Although Bakelite agitators are easy on clothes, they lack some washing effectiveness because of their smooth surface.

It is the particular object of this invention to provide an agitator structure adaptable for Bakelite moulding which is light in weight yet strong and effective in washing action.

Other objects and benefits will be disclosed in the following descriptions and drawing, it being understood that I am describing what is illustrative of a preferred embodiment of my invention.

Now referring to the drawing,

Fig. 1 is a plan view of a preferred embodiment of my agitator;

Fig. 2 is an elevation view of the agitator shown in Fig. 1, as it would appear on section lines 2—2, Fig. 1;

Fig. 3 is an enlarged broken sectional view of the radial rib in the base as it would appear on the section lines 3—3, Fig. 1; and

Fig. 4 is an enlarged broken cross sectional view of a vane as it would appear on the section lines 4—4, Fig. 1.

I designate the general base of the agitator by the numeral 10, and the vertical stem by the numeral 11. There are three vertical corrugated radial vanes 12, 13 and 14 and intermediate of the vanes are three radial ribs in the base, 15, 16, and 17.

Now referring to Fig. 3 it will be noted the radial ribs are formed by curved convex section 17' and that thus these ribs are formed in a substantially uniform cross section which does not appreciably increase the weight. Similarly, by referring to Fig. 4, the base of the vanes are formed by curved convex section 12'. It will be appreciated that this design is structurally strong and that the structure is attained by no appreciable increase in the volume of material. It will further be noted that the vanes 12, 13 and 14 are formed in vertical corrugations of practically uniform cross sections, and that this design is structurally strong without extensive increase in weight, and that the materials are used to best advantage because of the uniform thin cross sections involved.

It is well known in the art that clothes moving over an agitator are first sucked downward near the stem, and then driven radially outward, but the most contact with the vanes is radially outward. It will be appreciated that in this motion of the clothes over the vanes the corrugated structure here illustrated acts as a rub-board and is thus more effective than a straight plain vane.

It will further be appreciated that the radial ribs 15, 16 and 17 will be effective in creating water currents similar to the vanes, and that further, the structure definitely stiffens the base and protects it against shock when struck on the base between the vanes.

In moulding my agitator I provide a two part die with a parting line contiguous to the rim of the base at the point 10' as shown in Fig. 2. It will be appreciated then that all of the agitator above the point 10' must be drafted to permit withdrawal from the die. Consideration of the design and the product will show that my agitator is admirably designed for moulding in this manner, and that the whole may be produced without any excessive increase in weight while maintaining the most effective use of the material and greatest strength.

Having thus described my invention, I claim as new:

1. An agitator molded of non-metallic material and comprising a circular base having a relatively small hollow central vertical stem upstanding from said base and integral therewith, and radial vanes extending from said stem over the base, and upwardly concave sections of uniform thickness joining the base at the opposite sides of each vane with the lower edge of said vane and integral with both, each of said vanes above said concave sections comprising a single solid sheet of material of relatively uniform thickness and having vertical corrugations in opposite walls thereof extending throughout the major portion of the height of said vanes to the extreme upper edge thereof, and radial ribs extending outwardly on the base between the vanes, each of said ribs having concave sections forming opposite sides thereof, said sections being integral with the base and substantially of the same uniform thickness as the base.

2. An agitator molded of non-metallic material and comprising a circular base having a relatively small hollow central vertical stem upstanding from said base and integral therewith, and radial vanes extending from said stem over the base, and upwardly concave sections of uniform thickness joining the base at the opposite sides of each vane with the lower edge of said vane and integral with both, each of said vanes above said concave sections comprising a single solid sheet of material of relatively uniform thickness and having vertical corrugations in opposite walls thereof extending throughout the major portion of the height of said vanes to the extreme upper edge thereof, and radial ribs extending outwardly on the base between the vanes, each of said ribs being integral with the base and substantially of the same uniform thickness as the base.

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