April 3, 1962 J. M. NOWICKI 3,027,742

LINT FILTER FOR WASHING MACHINE

Filed June 11, 1959 2 Sheets-Sheet 1

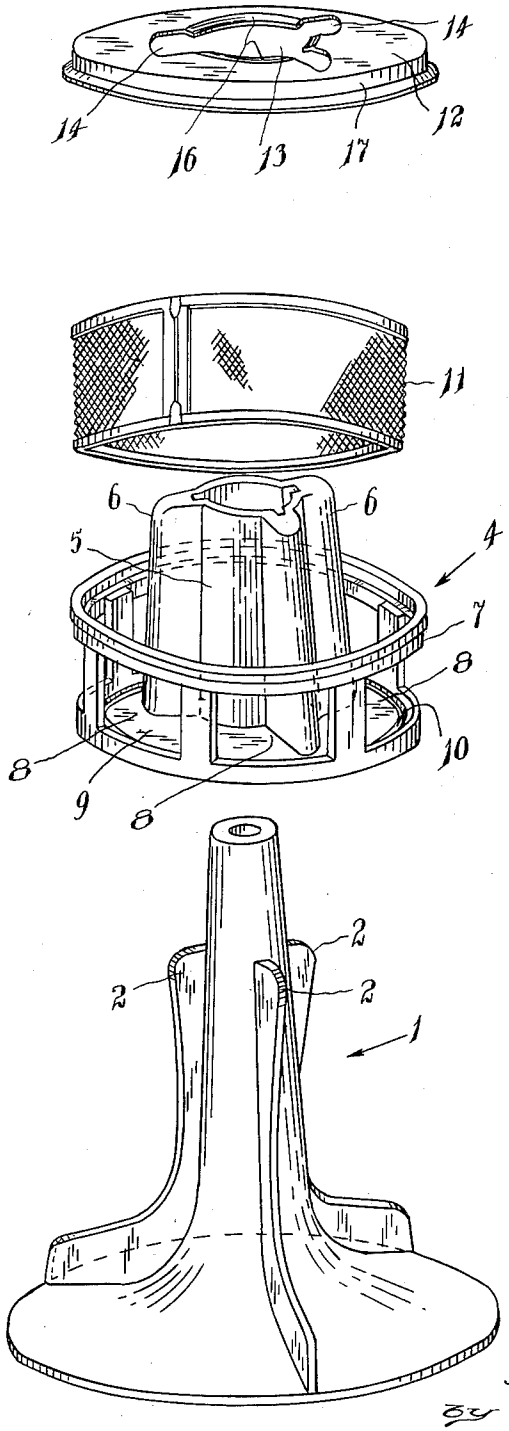


Fig. 1

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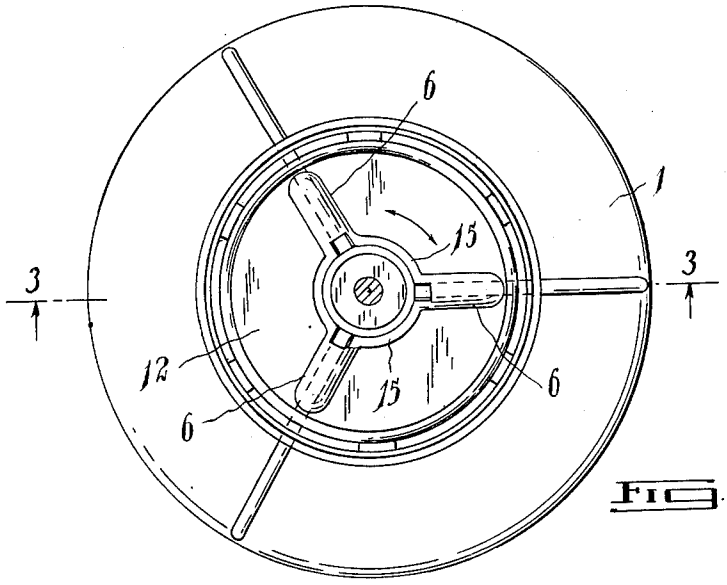


FIG. 2.

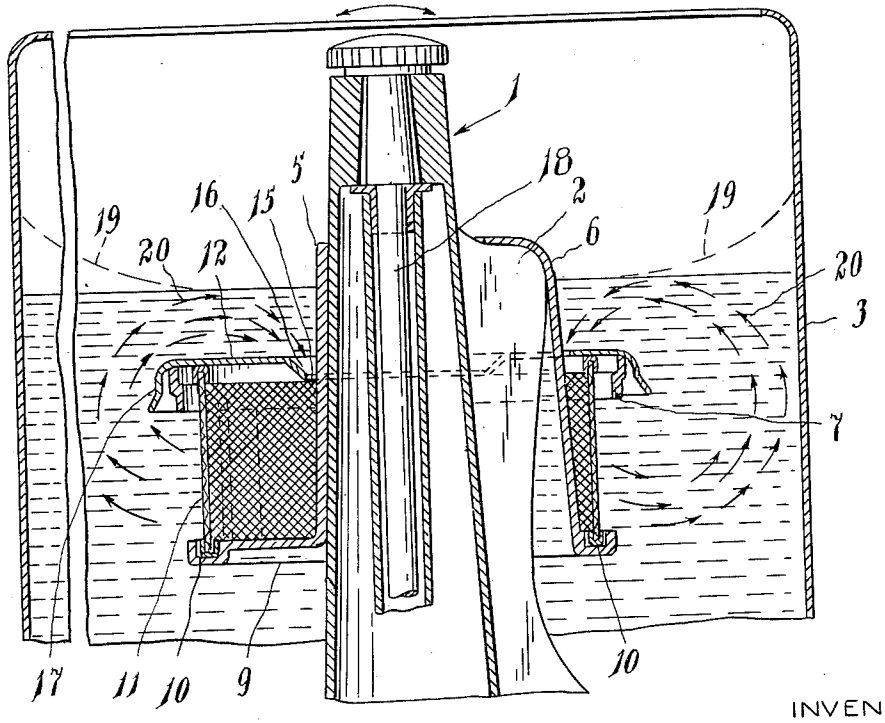


FIG. 3.

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LINT FILTER FOR WASHING MACHINE

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This invention relates to devices for removing or filtering lint from the circulating liquid in clothes washing machines or the like, and more particularly to lint filters for clothes washing machines which employ an agitator in the washing action.

The principal object of the invention is to provide an effective lint filter which will form an attachment that can be instantly mounted in operative position on existing agitator type washing machines without the use of any tool of any nature and without modifying the machine in any way.

Another important object is to provide a lint filter as aforesaid which will quickly and effectively carry out its lint removing or filtering action in response to the normal agitator movement without in any way adversely affecting the washing action of the machine but rather will augment the washing action by effecting an increase in liquid circulation.

A further important object is to provide a lint filter which will effectively trap and retain the lint in the filter and will prevent it from being flushed out to rejoin the clothing during the rinse or any other portion of the washing cycle.

Still another important object is to provide a lint filter of simple, sturdy and economical construction which will in no way harm the clothing being washed.

Again it is an object to provide for ready removal of the trapped lint collected by the filter and as well for the ready removal and cleaning of the lint filtering medium.

The principal feature of the invention resides in utilizing the oscillating action of the washing machine agitator to produce a liquid circulation to cause lint particles to move in a path bringing them into a trap which will screen out and retain the particles without interfering with, and in fact, augmenting the liquid circulation.

More particularly, according to the invention the lint filter or trap comprises a chamber presenting a screen or foraminous peripheral wall encircling the agitator and having an entrance for lint at the top thereof surrounding and immediately adjacent to the periphery of the agitator, the arrangement being such that on agitator movement to throw liquid centrifugally outwardly through the lint trapping foraminous peripheral wall, a liquid vortex is created centered on the axis of the agitator, and upon the agitator coming to rest preparatory to reversing its movement, lint carrying liquid will rush into the hollow of the vortex surrounding the agitator and through the agitator surrounding chamber entrance and into the chamber of the lint filter and the lint carried thereby will be removed upon the subsequent movement of the agitator to force the liquid centrifugally outwardly through the peripheral wall of the chamber.

Another important feature resides in providing means to support the lint trapping chamber for telescopic or sleeve engagement with the agitator for simple insertion and removal of the filter. More particularly in respect of this aspect of the invention it is an important feature to incorporate into the filter an arrangement of wings or fins which will receive and interlock with the fins of the agitator and will provide an increased fin area adjacent the upper end of the agitator to augment the vortex action produced by the agitator to thereby increase liquid circulation and correspondingly increase lint filtering.

Another important object is to provide a smooth upper surface for the lint chamber over which the lint particles are adapted to glide in reaching the chamber entrance. Preferably, according to the invention, the chamber entrance is provided with a downturned lip beneath which lint particles are adapted to be trapped to prevent escape back up through the entrance under any washing machine flushing action.

In connection with the latter features, according to the preferred form of the invention, the upper surface and entrance defining portion of the filter comprises a removable cover member. Also according to the preferred form of the invention, the body of the filter, with the exception of the peripheral wall, is formed as a moulded pan; while another important feature resides in forming the peripheral formainous wall of the filter as a removable screen.

Again it is a feature to provide a labyrinth seal between the screen and chamber body.

These and other objects and features will become apparent from the following detailed description taken in conjunction with the accompanying drawings in which,

FIGURE 1 is an exploded perspective view of a lint filter constructed to embody the invention ready for assembly onto a washing machine agitator.

FIGURE 2 is a top plan view showing the assembled filter sleeved on the agitator.

FIGURE 3 is a vertical sectional view on the line 3—3 of FIGURE 2 but showing the agitator in position in a washing machine illustrated partially in section and partially broken away.

With reference to the drawings and in particular, FIGURE 1, the lint filter or trap according to the invention is adapted to be employed with a washing machine having an upright oscillating agitator such as, for example, the agitator **1**, the general form of which is in common usage in washing machines. Agitators of this type are provided with some form of vane arrangement such as vanes **2** and in operation in a washing machine **3**, indicated in FIGURE 3, the agitator is driven to make a partial turn, comes to rest, then reverses its direction of movement back to the starting point and then comes to rest again and again reverses in the oscillating action. The drive for such an agitator is well known as is its function and forms no part of the present invention.

The lint filter or trap for use with such an agitator, according to the invention, comprises a screen-retaining pan **4**, shown particularly in FIGURE 1, which has a central upstanding sleeve formation **5** provided with a plurality of radially extending wings **6** of hollow configuration. The peripheral wall **7** of the pan is essentially merely a framework presenting a plurality of openings **8** therein. The bottom wall **9** of the pan is preferably of solid configuration and is provided with a circular groove **10** immediately adjacent the peripheral wall **7** to receive a circular screen **11** which preferably comprises a removable element which, when in position, will cover the openings **8** in the peripheral wall of the pan.

The filter is provided with a cover **12** which has a central opening **13** provided with radial slots **14** corresponding in size and shape to the wings of the sleeve formation **5** of the pan whereby the cover can be sleeved onto the sleeve formation **5** to close the pan while defining immediately adjacent to and surrounding the sleeve formation **5** an entrance **15** into the covered or closed pan **4**.

Preferably, the edge of the cover opening **13** between the slots **14** is downturned at **16** and the cover may conviently have an outer peripheral downturned flange **17**.

With the provision of the sleeve formation **5** the lint filter or trap can conveniently be installed on the agi-

tator of a washing machine by sleeving the entire assembly down onto the agitator with the hollow wing formations 6 of the sleeve 5 being adapted to receive the vanes 2 of the agitator as illustrated in FIGURE 3.

It will be noted that the sleeve formation 5 of the pan extends substantially above the peripheral wall 7, the arrangement being such that with the normal water level in the washing machine 3 and the filter sleeve fully home on the agitator, the water level will be slightly above the cover 12 and the entrance 15 into the pan. It will also be noted that with the filter in position on the agitator, the wings 6 of the sleeve formation 5 of the pan substantially increase the effective vane area of the agitator adjacent to the top thereof.

In operation, upon the agitator being oscillated through driveshaft 18, the movement of the oscillator will affect through the vanes 2 as augmented by the wings 6 a movement of the water or liquid radially outwardly to form a vortex as indicated by the dotted lines 19 in FIGURE 3. Under this centrifugal action, liquid within the pan 4 will be forced radially outwardly passing through the screen 11 which will trap out any lint particles carried thereby. Upon the agitator reaching the end of its travel in the one direction, it comes to rest, at which time the build-up of water radially outwardly from the agitator will rush inwardly toward the agitator, across the top of the cover 12 which will be of some smooth material, and may, for instance, be an enameled surface, and through the entrance 15 into the pan carrying loose lint particles therewith. On the next movement, the liquid will again be forced radially outwardly and will pass through the screen 11 and again any lint carried thereby will be trapped out and retained within the filter. The arrows 20 illustrate diagrammatically the circulation which takes place under agitator oscillation, and it will be understood that circulation is augmented by the increased effective vane area of the agitator provided by the wings 6.

It will be also appreciated that since the entrance 15 is immediately adjacent to and surrounds the agitator, and since there is a downturned lip 16 provided at the entrance, the circulation of the liquid will be such that there will be substantially no return of lint back up through the entrance 15. This will be true even if the water level is raised substantially above the pan as, for instance, in machines which provide an overflow rinse.

The maintenance of the filter will, of course, be extremely simple as the whole unit may be quickly pulled off the agitator and the screen 11 can be removed and rinsed and any accumulation of lint within the pan removed. It will be understood, of course, that after the washing machine 3 has been drained, the cleaning of the filter can conveniently take place without removing the pan by removing the cover and the removable screen.

Conveniently the pan 4 and sleeve formation 5 can be formed as a simple moulding and the screen 11 formed as a simple screen ring. However, it will be understood that if desired the screening might be made a permanent part of the pan and further, if desired, the bottom of the pan could comprise screening as well, although it is found in practice that the peripheral screen or foraminous wall provides adequate circulation for effective lint trapping.

By the provision of the groove 10 in the bottom wall 9 of the pan, a labyrinth seal between the bottom wall and the screen 11 is provided which will prevent seepage of the lint beneath the screen under the outward movement of the liquid on agitator oscillation. While several of the alternatives from the preferred form of the invention have been referred to, it will be understood that various other modifications in detail and construction may be made within the spirit of the invention without departing from the scope of the appended claims.

What I claim is:

1. A lint filter for a washing machine of the type having a clothes and washing liquid receiving tub provided with a central upright vaned reciprocal agitator extending above the normal liquid level in the tub, said filter comprising a filtering chamber having a bottom and a peripheral wall formation provided with openings therein, a central sleeve formation extending upwardly from said bottom and above said peripheral wall formation and provided with radially extending wings having slots therein opening interiorly of said central sleeve and adapted to sleeve onto the vanes of the agitator of a washing machine to support said filtering chamber below the normal liquid level in the tub, screening covering the openings in said peripheral wall, and a cover member substantially closing the top of said chamber and defining an entrance to said chamber at the top thereof inwardly of said peripheral wall and immediately surrounding said central sleeve formation, said wings being adapted to augment the action of the agitator vanes in producing radial outward liquid flow whereby said screening is adapted to trap lint interiorly of said chamber from such outwardly flowing liquid.

2. A lint filter as claimed in claim 1 in which said screening comprises a removable screen.

3. A lint filter as claimed in claim 2 in which said chamber bottom is imperforate and is formed with an annular groove therein immediately adjacent to said peripheral wall to receive the lower edge of said removable screen to form a labyrinth seal therewith.

4. A lint filter as claimed in claim 1 in which said cover member has a downturned outer flange and a downturned inner lip around said entrance.

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