

Sept. 20, 1960

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2,953,008

OILING DEVICE FOR WASHING MACHINES

Filed Sept. 25, 1959

FIG. 1

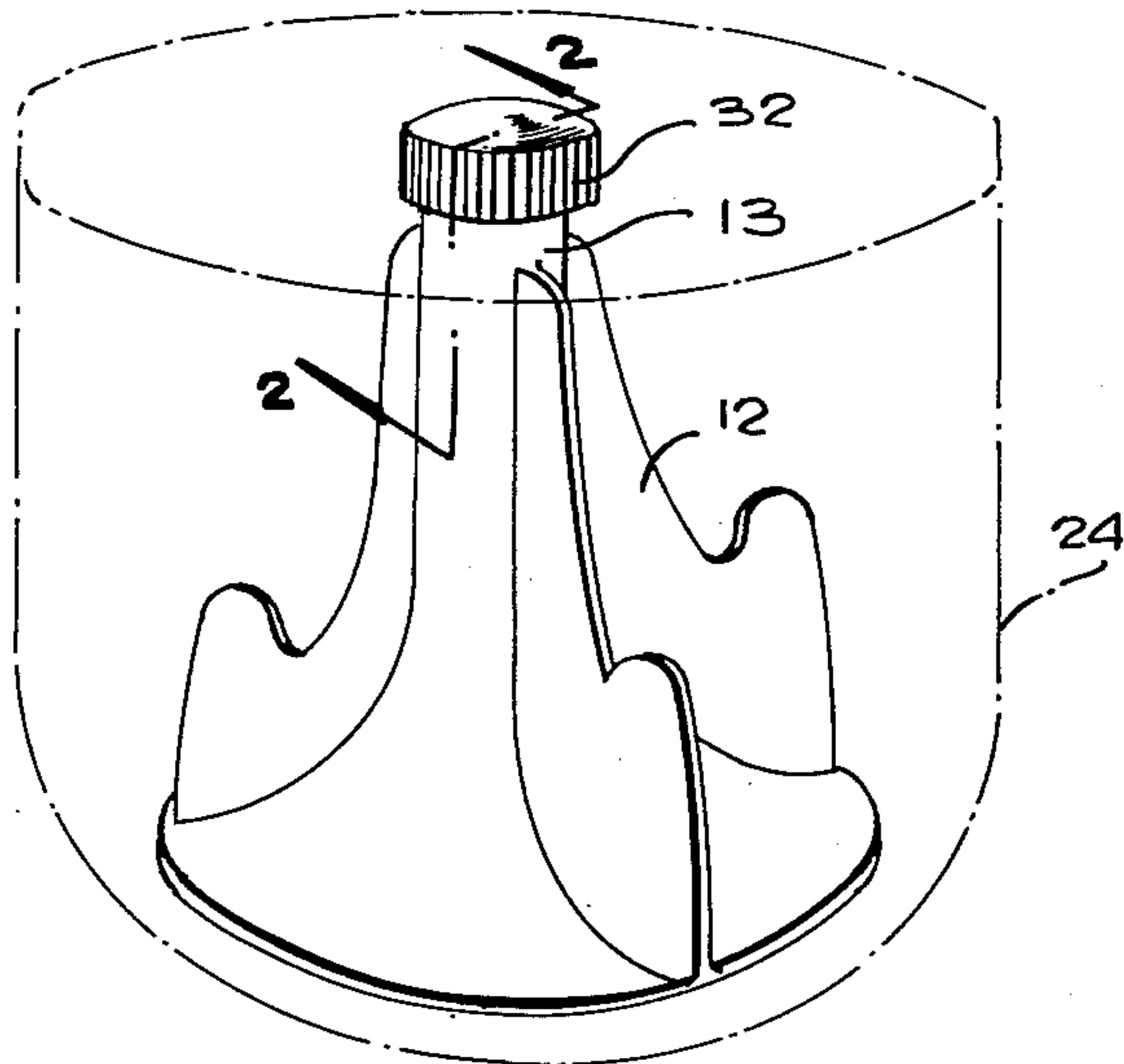


FIG. 3

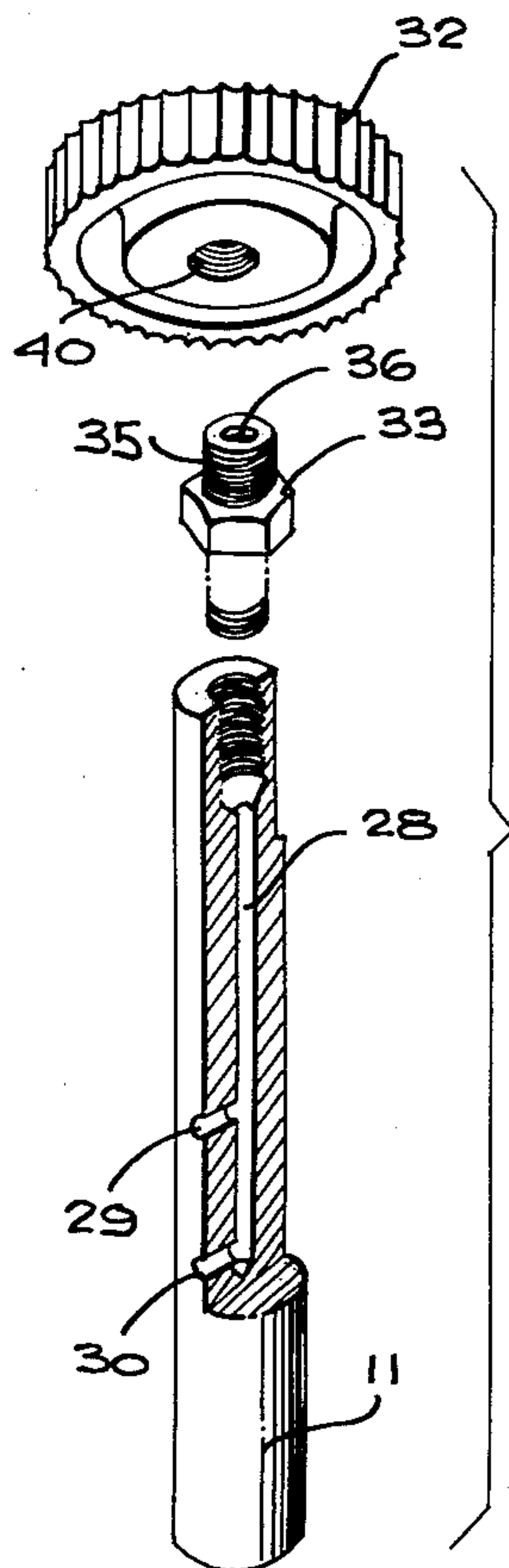
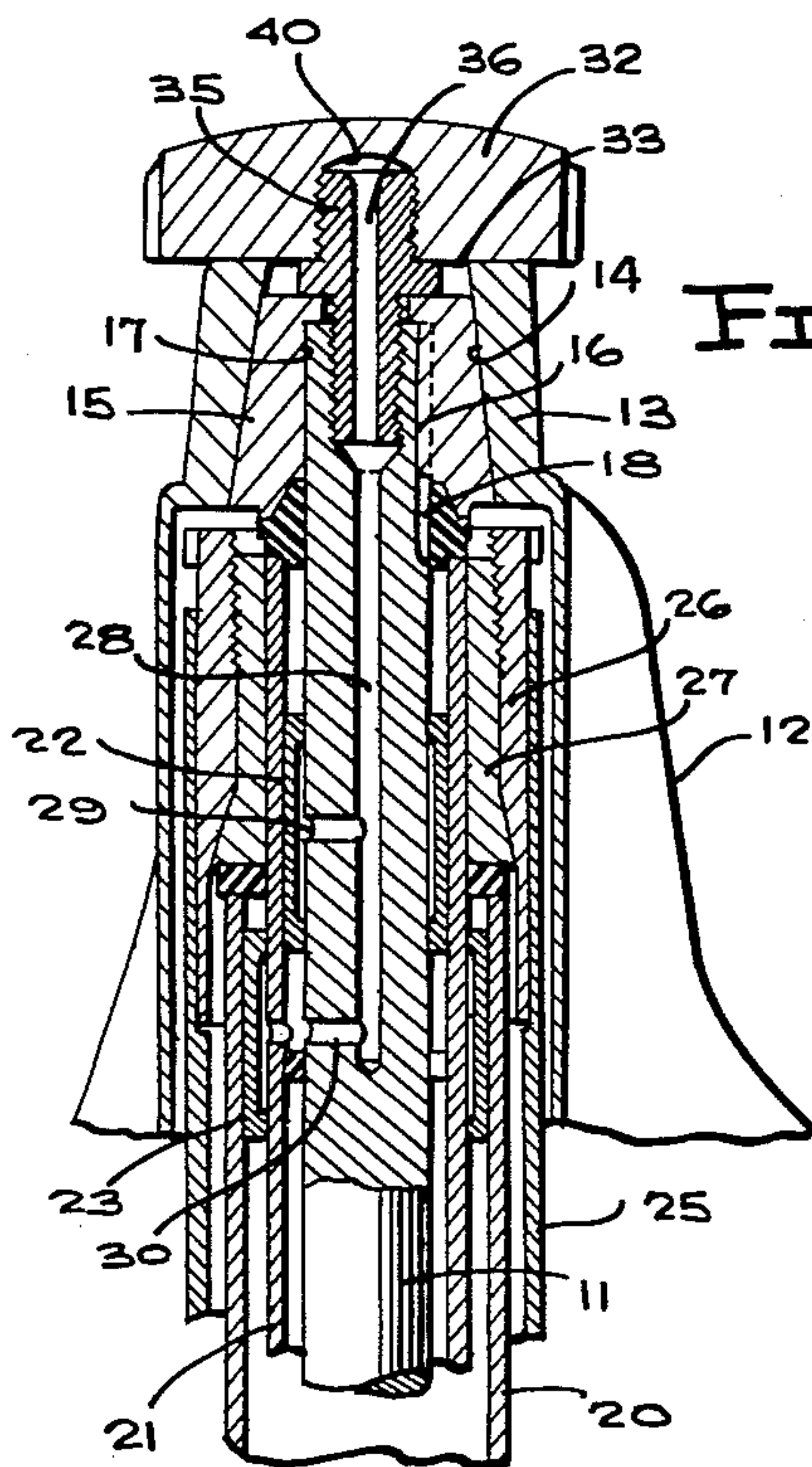


FIG. 2



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## OILING DEVICE FOR WASHING MACHINES

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Filed Sept. 25, 1959, Ser. No. 842,314

3 Claims. (Cl. 68—23)

This invention relates to washing machines of the agitator type, and more particularly to an improved structural assembly in a washing machine of the automatic or agitator type with special provisions incorporated therein for regularly admitting lubricant to the bearing surfaces associated with the agitator and spin tube of the washing machine.

A main object of the invention is to provide a novel and improved structural assembly for the agitator of a washing machine of the automatic type wherein special provision is made to allow the user to lubricate the bearing surface associated with the agitator and spin tube of the machine in a relatively easy and efficient manner, the structural elements being relatively simple, being inexpensive to fabricate, and involving merely the substitution of one of the elements ordinarily provided in a conventional automatic washing machine agitator assembly.

A further object of the invention is to provide an improved bearing assembly for the agitator and spin tube of an automatic washing machine which is provided with means for readily lubricating the assembly, the arrangement being such that access to the lubricating opening of the assembly may be obtained merely by removing the clamping cover cap employed to secure the agitator on the drive collar of the machine, whereby the lubricant may be applied to the bearing surfaces of the agitator assembly which ordinarily do not receive lubricant and which therefore are subject to considerable wear and require early replacement in conventional washing machines.

Further objects and advantages of the invention will become apparent from the following description and claims, and from the accompanying drawings, wherein:

Figure 1 is a perspective view of the agitator and cover cap of a washing machine of the automatic type, the washing machine basket being illustrated in dotted view.

Figure 2 is an enlarged vertical cross sectional view taken substantially on the line 2—2 of Figure 1, and illustrating an improved means for lubricating the bearings associated with the agitator and spin tube of the washing machine, in accordance with the present invention.

Figure 3 is a perspective view, partly in cross section, illustrating the manner in which the hollow retaining stud, in accordance with the present invention, is disposed between the top end of the agitator driving shaft and the clamping cover cap employed to secure the agitator on the drive collar of the machine, the parts being shown in separated positions.

Referring to the drawings, 11 designates the vertical driving shaft of a washing machine of the automatic type employing an oscillating agitator, the agitator being shown at 12 and being integrally formed with the top collar portion 13 which has an internal, downwardly flaring hexagonal bore 14 non-rotatably and lockingly engaged on a downwardly flaring drive collar 15, which

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is also hexagonal in horizontal cross section as is well known to those skilled in the art. The drive collar 15 is rigidly secured on the top end of the vertical driving shaft 11 and is held against rotation with respect thereto by a longitudinal key 16 which is integrally formed in the bore 17 of the collar 15 and which is received in a longitudinal keyway 18 formed in the top portion of the shaft 11.

Shaft 11 is rotatably mounted axially in a stationary vertical tubular post 20, which also contains the vertical spin tube 21 arranged concentrically in the tube 20 and located between the shaft 11 and said tube 20. A first bearing sleeve 22 is disposed between the shaft 11 and the spin tube 21 and a second bearing sleeve 23 is disposed between the stationary tubular post 20 and the spin tube 21, as shown in Figure 2.

The bracket member 24, shown in dotted view in Figure 1, is provided with a vertical upstanding central sleeve portion 25 which is rigidly connected at its top end to the top end of the spin tube 21 through a pair of friction collars 26 and 27 in a manner well known to those skilled in the art.

In the conventional design of the elements above described, namely, the design heretofore employed, a quantity of lubricant is initially provided during the manufacture of the machine, the lubricant being placed in a vertical bore 28 formed in the top end of the shaft 11, whereby the lubricant may be admitted through radial bores 29 and 30 to the respective bearing members 22 and 23. A solid stud is threadedly engaged in the top end of the shaft 11 and is provided with a threaded top end on which is threadedly engaged the removable cover cap 32, which bears on the top rim of the agitator collar 13 to secure the collar 13 on the drive collar 15. The retaining stud is usually provided with a flange 33 at its intermediate portion which clampingly engages on the top end of the drive collar 15. However, this stud is usually so tightly engaged that it is quite difficult to remove same, and ordinarily not within the range of skill of the normal user. Therefore, the stud is never removed and consequently the supply of lubricant is normally never replenished. Obviously, after a period of use, the bearing members 22 and 23 receive insufficient lubricant, causing said bearing members to wear and requiring relatively early replacement thereof.

In accordance with the present invention, the original retaining stud is eliminated and a hollow retaining stud, shown at 35, is employed in place thereof, the stud 35 being provided with the axial bore 36 which opens at the top end of the stud and which is in communicative relationship with the vertical axial bore 28 of the driving shaft 11. The hollow stud 35 is provided with a retaining flange 33 at its intermediate portion which clampingly engages the top surface of the drive collar 15, as is clearly shown in Figure 2. The cover cap 32 is threadedly engaged on the top portion of the retaining stud 35 above the flange 33, as shown, and is arranged to exert clamping pressure on the top surface of the agitator collar member 13.

When the hollow stud 35 is employed, in accordance with the present invention, access to the lubricating bore 28 is easily obtained, since it is merely necessary to remove the cover cap 32, whereby the top end of the communicating vertical bore 36 is exposed, allowing the necessary lubricant to be admitted as often as required to properly lubricate the bearing sleeves 22 and 23, as well as the other bearing portions in communication with the spaces adjacent to the outlets of the passages 29 and 30.

Normally, the cover cap 32 is removed to allow the agitator 12 to be disengaged from the driving collar 15 to permit cleaning around the basket post element



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25, and to permit cleaning the bottom portion of the basket normally covered by the agitator 12. At this time the hollow retaining stud 35 is exposed, providing an opportunity for the user to add lubricant to the vertical passage 28, as required to maintain proper lubrication of the bearing elements associated with the shaft 11 and spin tube 21. The ability to maintain proper lubrication of the relatively inaccessible bearing sleeves 22 and 23 and other associated bearing surfaces thus greatly prolongs the useful life of the bearing elements and reduces the cost of maintaining the washing machine in proper working condition.

With sufficient lubricant available, not only is mechanical wear on the bearing surfaces reduced, but also said bearing surfaces are protected against damage from rust, water, or harmful detergents, employed in connection with the operation of the washing machine.

It will be noted that the threaded top end of the retaining stud 35 is of substantial height, requiring a recess 40 to be provided in the cover cap 32 of at least corresponding height. When the cover cap 32 is engaged on the threaded top end portion of the retaining stud 35, a substantial amount of air is trapped in the recess 40, and as the cover cap is screwed down into engagement with the top rim of the agitator collar member 13, the trapped air is compressed and acts to force the lubricant downwardly through the registering vertical bores 36 and 28. The trapped air thus acts as a pressure means to inject the lubricant into the assembly and to force the lubricant into contact with the various bearing surfaces thereof.

While a specific embodiment of an improved washing machine agitator assembly and means for lubricating same has been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore, it is intended that no limitations be placed on the invention except as defined by the scope of the appended claims.

What is claimed is:

1. In a washing machine, a vertical tubular supporting post, a spin tube rotatably mounted in said supporting post, a vertical driving shaft rotatably mounted within said spin tube, said shaft being provided with an axial lubricating bore and lateral passages communicating with said bore and opening into the spin tube, a drive collar mounted on the top end of the driving shaft, and a flanged retaining stud threadedly engaged axially in the top end of the driving shaft and clampingly engaging said drive collar, said stud being provided with an axial bore communicating with said first-named axial bore, for admitting lubricant into said first-named bore.

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2. In a washing machine, a vertical tubular supporting post, a spin tube rotatably mounted in said supporting post, a vertical driving shaft rotatably mounted within said spin tube, said shaft being formed with an axial lubricating bore and lateral passages communicating with said bore and opening into the spin tube, a drive collar mounted on the top end of the driving shaft, a flanged retaining stud threadedly engaged axially in the top end of the driving shaft and clampingly engaging said drive collar, said stud being formed with an axial bore communicating with said first-named axial bore, for admitting lubricant into said first-named bore, an agitator supportingly engaged on said drive collar, and a removable cover cap threadedly engaged on said stud and clampingly engaging said agitator, said cap being formed with a recess receiving the top end of said retaining stud and being adapted to trap air in the top end of said last-named bore and to compress the trapped air when the cover cap is screwed into clamping engagement with the agitator, whereby to force lubricant through said axial bores.

3. In a washing machine, a vertical tubular supporting post, a spin tube rotatably mounted in said supporting post, a vertical driving shaft rotatably mounted within said spin tube, said shaft being provided with an axial lubricating bore and lateral passages communicating with said bore and opening into the spin tube, a drive collar mounted on the top end of the driving shaft, a vertical stud threadedly engaged axially in the top end of the driving shaft, a retaining flange on the intermediate portion of said stud clampingly engaging said drive collar, said stud being formed with an axial bore communicating with said first-named axial bore for admitting lubricant into said first-named bore, an agitator supportingly and non-rotatably engaged on said drive collar, and a removable cover cap threadedly engaged on said stud above said retaining flange and clampingly engaging said agitator, said cap being formed with a recess receiving the top end of said retaining stud and being adapted to trap air in the top end of said last-named bore and to compress the trapped air when the cover cap is screwed into clamping engagement with the agitator, whereby to force lubricant through said axial bores.

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