

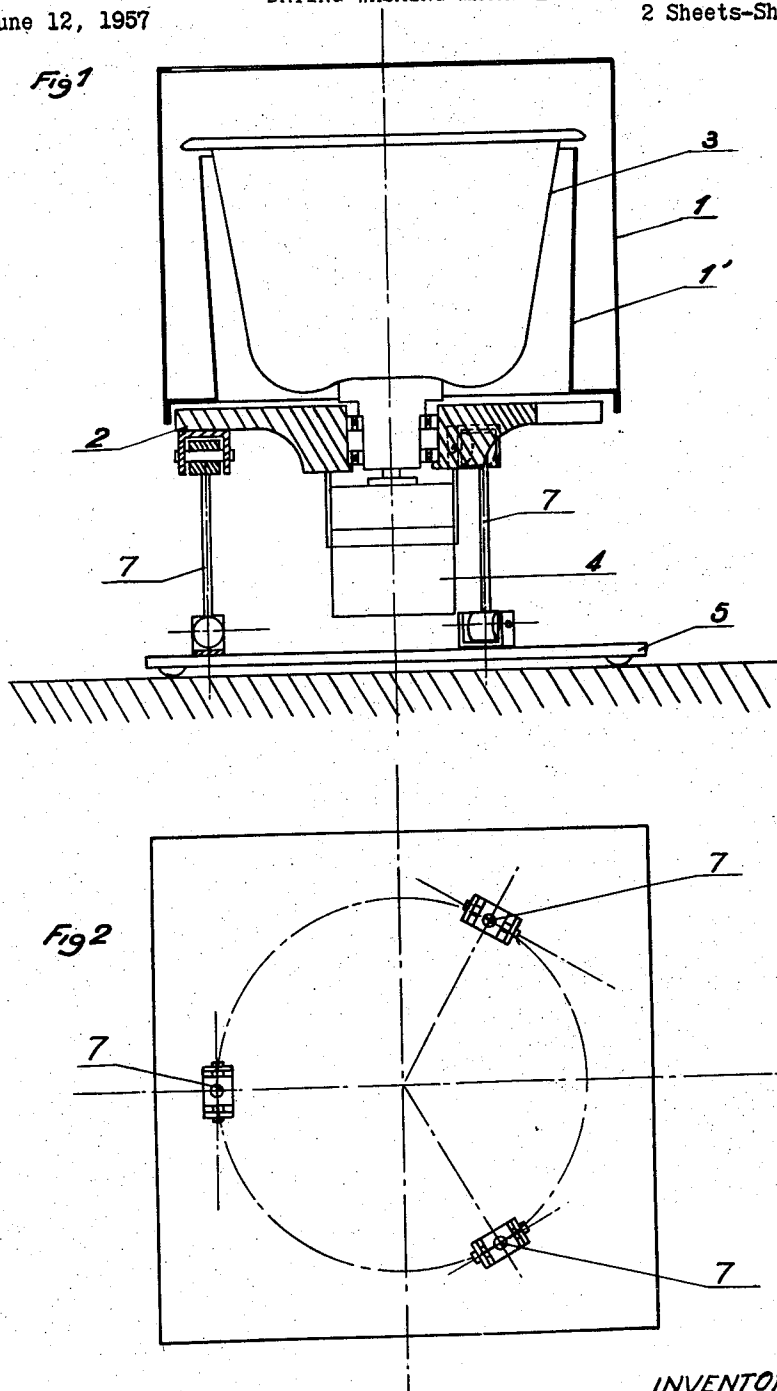
Aug. 9, 1960

V. OBERMAJER
ANTI-VIBRATORY SUSPENSION FOR CENTRIFUGALLY
DRYING WASHING MACHINE

2,948,401

Filed June 12, 1957

2 Sheets-Sheet 1



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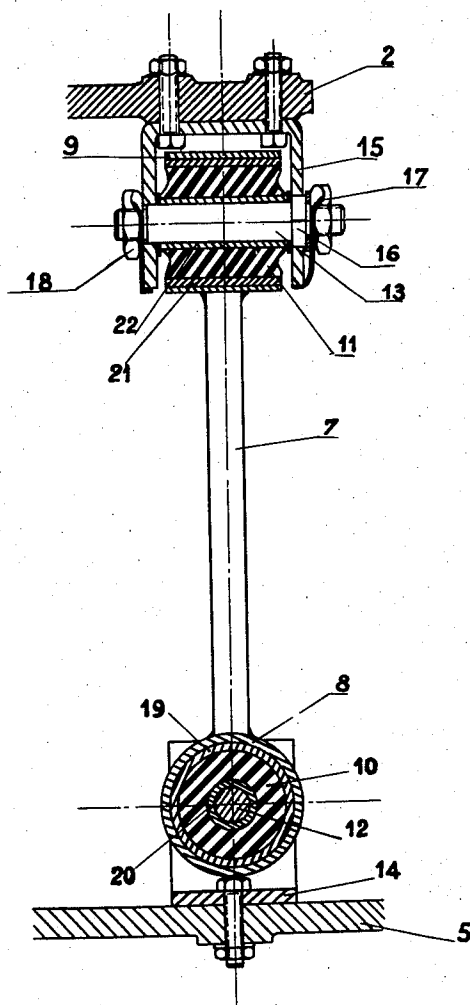


Fig 3

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ANTI-VIBRATORY SUSPENSION FOR CENTRIFUGALLY DRYING WASHING MACHINE

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7 Claims. (Cl. 210—365)

Washing machines are known, in which, after the actual washing, the cloth is dried by the rapid rotation of the tank containing the cloth. Now, the bulk of the cloth to be dried is never centered on the rotation axis of the tank; thence during centrifugation there is a stress of inertia commensurate to the moving mass and to the distance between the center of gravity of this mass and the rotation axis.

It is well known that, when this is the case, by and by as the rotation speed of the tank increases, there arises a critical speed during which dangerously wide oscillations can be attained.

Several arrangements have been proposed for ensuring passing without difficulties of this critical speed. The present invention concerns a new and particularly simple way of achieving this end.

Object of the invention is an antivibratory suspension for centrifugally drying washing machines, characterized in that the frame-work of the tank and the support of the machine are connected by means of three arms, angularly distributed on a circle at 120°, and oscillating vertically. The ends of these arms are fixed on the frame-work and on the support with interposition of bearings, each bearing being formed of elastic compressed and vulcanized rubber between two metallic cylinders, the two bearings of the same arm being set at 90° in respect of each other.

The annexed drawing shows an example—with no restriction to just this one—of the realization of the invention.

On this drawing:

Figure 1 is a schematical view, in vertical section, of a washing machine perfected according to the invention.

Figure 2 is a view of the plan of the support of the machine, showing the respective location of the oscillating arms.

Figure 3 is a view of one of the oscillating arms with its connections shown in sections.

As shown in Figure 1, the machine includes a unit comprising essentially a tank 1—1', integral with the frame-work 2, and a second tank 3 inside the first. This tank 3, immobile during the washing, can be made to rotate rapidly for the drying by means of an electric motor 4, integral with the frame-work 2. Owing to the shape of the tank 3, widening towards the top of the tank 3, the water, during drying, rises along the wall and, flowing out, falls into a ring-shaped tank, formed by the tank 1 and a casing around the tank 3.

All the parts mounted on the frame-work 2 start oscillating during the drying, and it is this oscillating movement which has to be opposed.

To this end the frame work 2 of the washing unit and the base or support 5 are connected by means of the oscillating arms 7—presumed to be three—and distributed on a circle at 120° (Figure 2). The arms 7 are connected at their opposite ends by bearing means, to be described hereinafter, to the washing and centrifuging unit and base, respectively, and the length of

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the arm portions intermediate the bearings is such, and the horizontal spacing of the arms is such, that a useful space of substantial vertical and horizontal extent is provided in the midst of, or interiorly of, said arms to accommodate, in spaced relationship with respect to the base 5, a vertically extending portion of the centrifuging unit such as the electric motor 4 and the support therefor, as is clearly illustrated in Figure 1.

According to Figure 3, each of these arms consists of a rigid rod 7, having at both ends the cylinders 8 and 9 with their axes oriented horizontally in perpendicular directions.

The inside of each cylinder has been fitted under strong pressure with a bearing consisting of two metallic coaxial tubes (19 and 20, 21 and 22) enclosing between them a compressed vulcanized rubber cylinder (10 and 11).

In the axis of each bearing is also fitted by pressure a solid steel pin (12 and 13). Through the medium of this axis the rod 7 can be fixed elastically on the frame-work 2 of the tank and on the support 5 of the machine: for instance by means of straps (14 and 15) integrated, with bolts, one with the frame-work and the other with the support. The pins (12 and 13) are immobilized in respect of the straps by a hexagonal head-piece 16, placed in a hole in the strap. The fixing of the axis is completed by means of two nuts 17 and 18. The axes of the pins 13 at the upper ends of the rods are oriented so as to point in a plurality of different directions and, accordingly, the pins in the lower ends of the rods will also be pointed in a plurality of different directions but displaced 90° with respect to the directions of pins 13.

Should the oscillations tend to make the rod 7 rotate about pin 12 in the plane of Figure 3 with respect to the support 5, a torsion stress is opposed by the rubber 10 and a flexion stress by the rubber 11, elastic stresses both.

If the rod 7 tends to move about pin 13 perpendicularly to the plane of the figure, then it is the rubber 11 which opposes an elastic torsion resistance, and the rubber 10 the flexion stress.

In order to realize a system of elastic suspension meeting the aim, the rubber must have a compression grade well defined by the masses moved during drying, which compression grade can be experimentally established.

The arms 7 are located at spaced points around the axis of rotation of the centrifuging unit and in spaced relationship with respect thereto. The arms 7 and the structures at their respective ends are so constructed and arranged as to provide generally the same resistance at each arm against displacement of the centrifuging unit in the direction radially from its rotational axis.

What I claim is:

1. In a machine for treating textiles with liquid, a base, a centrifuging unit for drying the textiles, said unit including a member rotatable about a vertical axis and carrying said textiles during centrifugal extraction of liquid therefrom and drive means connected to said member rotatably driving the latter, and anti-vibration means for supporting said unit on said base, said supporting means comprising a plurality of vertically extending elongated arms and resilient bearing means at opposite ends of each arm connecting said ends respectively to said base and to said unit, the bearing means for each respective arm being spaced one above the other by an elongated intermediate portion of the arm, the length of said arms being such, and the arms being spaced horizontally to such an extent, that a useful space of substantial vertical and horizontal extent is provided in the midst of said arms, which space accommodates a vertically extending portion of the structure of said centrifuging unit in spaced relationship with respect

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to said base, each said bearing means comprising inner and outer coaxial members and elastic material compressed therebetween, the respective axes of said members at opposite ends of each arm being oriented at 90° relative to each other, the axes of said members at the upper ends of said arms being directed in a plurality of different directions one of said members of each said bearing means being secured to said arm and the other member being secured to a respective one of said base and said unit, said elastic material being subject to torsional and flexing stresses during oscillatory movement of said unit relative to said base, said centrifuging unit being displaceable transversely of said vertical axis due to unbalanced forces occurring thereon during centrifuging operation, said arms being located at spaced points around said axis and at a substantial distance therefrom and being so constructed and arranged as to provide at each arm generally the same resistance to displacement of the centrifuging unit in the direction radially from said axis.

2. Apparatus according to claim 1, wherein said arms are symmetrically disposed about a central vertical axis of said machine.

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3. Apparatus according to claim 1, wherein said arms are distributed around a circle at 120° intervals.

4. Apparatus according to claim 1, wherein said axes are horizontal.

5. Apparatus according to claim 1, wherein said arms are connected at their upper ends to said unit and at their lower ends to said base.

6. Apparatus according to claim 1, wherein said inner members are tubular and secured to one of said base and said unit by means including a pin extending there-through.

7. Apparatus according to claim 1, wherein said members are metal cylinders.

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