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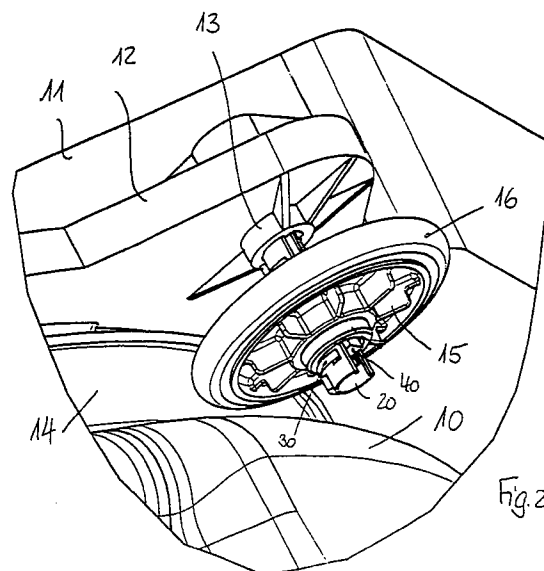
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(54) **Washing dryer**

(57) The invention relates to a washing dryer with a drum which is rotatably mounted and which may be rotated, which is additionally guided in the vicinity of the intake side by means of rollers which are supported on the drum shell and which are rotatably mounted by means of bearing axes in a casing portion surrounding the intake opening. The bearing is simplified with simple means and in addition permanently lubricated, in that the bearing axle is in the form of a hollow axle which is C-shaped in cross-section, and into which there is inserted in the vicinity of the bearing bore of the roller an oil-saturated felt block, in that the felt block projects out of the hollow axle and is resiliently supported on the bearing bore of the roller, in that the roller is positioned axially on the hollow axle by means of two securing members, and in that the securing members are provided with retaining projections, which project through apertures in the hollow axle, into said axle, and axially secure the felt block.



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Description

The invention relates to a washing dryer with a drum which is rotatably mounted and which may be rotated, which is additionally guided in the vicinity of the intake side by means of rollers which are supported on the drum shell and which are rotatably mounted by means of bearing axes in a casing portion surrounding the intake opening.

A washing treatment machine of this type is known from CH-PS 429 644. In this known washing treatment machine the bearing and lubrication of the roller presents considerable difficulty. On the one hand the bearing axis, in the form of a rotary part, is extremely expensive to manufacture and requires a considerable outlay on assembly for securing the bearing axis on the casing portion and for securing the roller axially on the bearing axis. In addition there is no possibility of lubricating the bearing for the roller over a long operational period, so that repeated subsequent lubrication is necessary if disturbing running noise is to be avoided.

The purpose of the invention, in a washing dryer of the type already mentioned, is to improve the bearing for the roller supporting the drum on the intake side in such a way that simple assembly and a type of permanent lubrication of the bearing is achieved with simple parts.

The object is achieved according to the invention in that the bearing axle is in the form of a hollow axle which is C-shaped in cross-section, and into which there is inserted in the vicinity of the bearing bore of the roller an oil-saturated felt block, in that the felt block projects out of the hollow axle and is resiliently supported on the bearing bore of the roller, in that the roller is positioned axially on the hollow axle by means of two securing members, and in that the securing members are provided with retaining projections, which project through apertures in the hollow axle, into said axle, and axially secure the felt block.

This design of the bearing axle leads to a part which is simple and cost-effective to manufacture. The roller may be axially positioned on the hollow axle by means of two securing members. The oil-saturated felt block inserted into the hollow axle is at the same time axially secured, so that it retains its position relative to the bearing bore of the roller and permanently lubricates it. The elastic property of the felt block is utilised in such a way that a compensation for tolerance takes place. In addition, the felt block prevents dirt particles from penetrating into the bearing and can also bind said particles. In this way a type of permanent lubrication is achieved. The securing members are arcuate in form and provided on the inner sides facing one another of their legs with engagement projections, which engage resiliently in engagement apertures facing one another of the hollow axle, so that they may be rapidly and simply engaged on the hollow axle. During this engagement procedure, the retaining projection is introduced into the hollow axle and secures the felt block axially.

The securing members abut closely against the outer contour of the hollow axle.

According to a preferred embodiment, the retaining projections and engagement projections of these securing members, as well as the apertures and the engagement apertures of the hollow axle, have rectangular cross-sections co-ordinated with one another.

If according to one embodiment the free longitudinal edges of the hollow axle merge into edges aligned towards one another and lying in one plane, then sharp edges entailing a risk of injury during assembly are avoided. In addition, these edges reinforce the hollow axle and also the hollow axle may be non-rotatably secured in a receiving means of a bearing bush adapted to the non-round outer contour.

According to one embodiment the hollow axle and the securing members extend over an angular range of more than 180°.

According to one embodiment, in order to secure the hollow axle on the casing portion, the hollow axle is provided on the end facing away from the roller with engagement apertures into which engagement members of a bearing bush, accommodating the hollow axle, of a bearing flange of the casing portion resiliently engage.

According to one embodiment the securing member, with the retaining projection and the engagement projections, is formed as a one-piece plastics injection moulded part, while the hollow axle with all its members is produced as a hardened stamped and shaped part.

The invention will be described in more detail with reference to an embodiment given by way of example and shown in the drawings, which illustrate:

- 35 Figure 1: a perspective view of a drum of a washing dryer with a casing portion surrounding the intake opening thereof, and upon which there is rotatably mounted a roller,
- 40 Figure 2: a perspective detail on a large scale from Figure 1 with the bearing for the roller,
- Figure 3: an exploded view of a roller, a felt block, two securing members and a hollow axle, necessary for the bearing,
- 45 Figure 4: a perspective view of the roller axially positioned on the hollow axle with felt block, and
- 50 Figure 5: a longitudinal section through the roller rotatably mounted and lubricated on the casing portion.

55 As Figure 1 shows, there is located on the intake side of the drum 10 a casing portion 11, which in a known way is used for articulating the doors and for inserting a lint screen. In addition, it has a portion of the air duct for the process air circuit. The present case

involves the rotary bearing or roller 15, which is supported on a running surface 14 on the shell surface of the drum 10. The roller 15 is mounted on a bearing flange 12 of the casing portion 11, which surrounds the intake opening of the drum 10. The bearing of the drum 10 on the opposite end face and the drive means for its rotary movement are not shown in Figure 1, as they are of no importance for the present invention.

In the enlarged view in Figure 2 it can be seen that the roller 15 carries a rubber tyre 16 and is supported thereby on the running surface 14 of the drum shell. The bearing flange 12 is integrally moulded on the casing portion 11 and has a bearing bush 13, into which the bearing axle of the roller is inserted.

As Figure 3 shows, the bearing axle for the roller 15 is in the form of a hollow axle 20 with a C-shaped cross-section. On the free longitudinal edges, the hollow axle 20 is provided with rims 21 and 22 aligned towards one another and lying in one plane. For axial positioning of the roller 15, pairs of mutually-opposed engagement apertures 23 and 24 are provided in the hollow axis, and which for example have a rectangular cross-section. Before the hollow axle 20 is introduced into the bearing bore 17 of the roller 15, an oil-saturated felt block 40 is inserted into the hollow axle 20 and can be secured axially in one direction by means of a securing member 30. Thus for example a securing member 30 may be resiliently engaged with engagement projections 31 on the inner sides of its legs into the engagement apertures 23 and 24. The retaining projection 32 of the securing member 30 is introduced into the hollow axle 20 through the aperture 26 and serves as a stop for the felt block 40.

The hollow axle with the inwardly-rounded rims 21 and 22 has a non-rounded outer contour. If the bearing bush 13 of the bearing flange 12 is adapted with the receiving means to this non-rounded contour of the hollow axle 20, then the introduced hollow axle 20 is non-rotatably secured in the bearing bush 13.

The end of the hollow axle 20 is thrust into the bearing bore 17 of the roller 15. The end of the hollow axle 20 projecting on the opposite side out of the bearing bore 17 is positioned in the other axial direction with the second securing member 30. Thus the engagement projections 31 engage in the engagement apertures 23 of the hollow axle 20, and the retaining projection 32 of the securing member 30, after passing through an aperture 26 in the hollow axle 20, secures the felt block 40 in the other axial direction. The oil-saturated felt block 40 projects out of the hollow axle 21 and is resiliently supported on the bearing bore 17 of the roller 15, as can be seen from the assembled condition of roller 15 and hollow axle 20 shown in Figure 4.

On its free end, the hollow axle 20 carries a further pair of engagement apertures 25, into which engagement members 18 of the bearing bush 13 engage, when the hollow axle 20 is introduced with the roller 15 in the correct angular position, as the cross-section in Figure 5 shows. The roller 15 is clearly axially positioned

between the two securing members 30 and the retaining projections 32 of the same secure the felt block 40 in such a way that it lies permanently in the bearing bore 17 of the roller 15. The securing members 13 in the central region are reinforced with the retaining projection 32 as an axial stop 33; they are arcuate in shape, so that they abut closely on the periphery of the hollow axle 20. The hollow axle 20 and the securing member 30 extend over an angular range of more than 180°, yet leave a sufficiently wide slot for the introduction of the felt block 40.

The engagement projections 31 and the retaining projections 32 are rectangular in cross-section, and coordinated with the engagement apertures 22 and 23 and the apertures 26 in the hollow axle 20, so that clear resilient engagement and a good hold of the securing members 30 on the hollow axle 20 is achieved.

The securing member 30, with the engagement projections 31, the retaining projection 32 and the axial stop 33 are produced as a one-piece plastics injection moulded part. The hollow axle 20 is formed from a hardened stamped and shaped part. The oil-saturated felt block 40 provides a type of permanent lubrication for the bearing of the roller 15 on the hollow axle 20. The felt block 40 also keeps dirt particles away from the bearing, and can also bind them.

Claims

1. Washing dryer with a drum which is rotatably mounted and which may be rotated, which is additionally guided in the vicinity of the intake side by means of rollers which are supported on the drum shell and which are rotatably mounted by means of bearing axes in a casing portion surrounding the intake opening, characterised in that

the bearing axle is in the form of a hollow axle (20) which is C-shaped in cross-section, and into which there is inserted in the vicinity of the bearing bore (17) of the roller (15) an oil-saturated felt block (40),

in that the felt block (40) projects out of the hollow axle (20) and is resiliently supported on the bearing bore (17) of the roller (15),

in that the roller (15) is positioned axially on the hollow axle (20) by means of two securing members (30),

and in that the securing members (30) are provided with retaining projections (32), which project through apertures (26) in the hollow axle (20), into said axle, and axially secure the felt block (40).

2. Washing dryer according to Claim 1,

characterised in that

the securing members (30) are arcuate in shape and are provided on the inner sides facing one another of their legs with engagement projections (31), which engage resiliently in engagement apertures (23 or 24), mutually opposite one another, of the hollow axle (20). 5

3. Washing dryer according to Claim 1 or 2, 10
characterised in that

the retaining projections (32) and the engagement projections (31) of the securing members (30), and the apertures (26) and the engagement apertures (23, 24) of the hollow axle (20) have rectangular cross-sections co-ordinated with one another. 15

4. Washing dryer according to one of Claim 1 to 3, 20
characterised in that

the free longitudinal edges of the hollow axle (20) merge into rims (21, 22) aligned towards one another and lying in one plane, and in that 25
the hollow axle (20) is secured with its non-rounded outer contour non-rotatably in a bearing bush (13) with an aperture adapted to the non-rounded outer contour.

5. Washing dryer according to one of Claims 1 to 4, 30
characterised in that

the hollow axle (20) and the securing members (30) extend over an angular range of more than 180°. 35

6. Washing dryer according to one of Claims 1 to 5, 40
characterised in that

the hollow axle (20) is provided on the end remote from the roller (15) with engagement apertures (25) into which there resiliently engage engagement members (18) of a bearing bush (13), accommodating the hollow axle (20) of a bearing flange (12) of the casing portion (11). 45

7. Washing dryer according to one of Claims 1 to 6, 50
characterised in that

the securing member (30), with the retaining projection (32) and the engagement projection (31), is produced as a one-piece plastics injection moulded part. 55

8. Washing dryer according to one of Claims 1 to 7, characterized in that

the hollow axle (20) is in the form of a hardened stamped and shaped part.

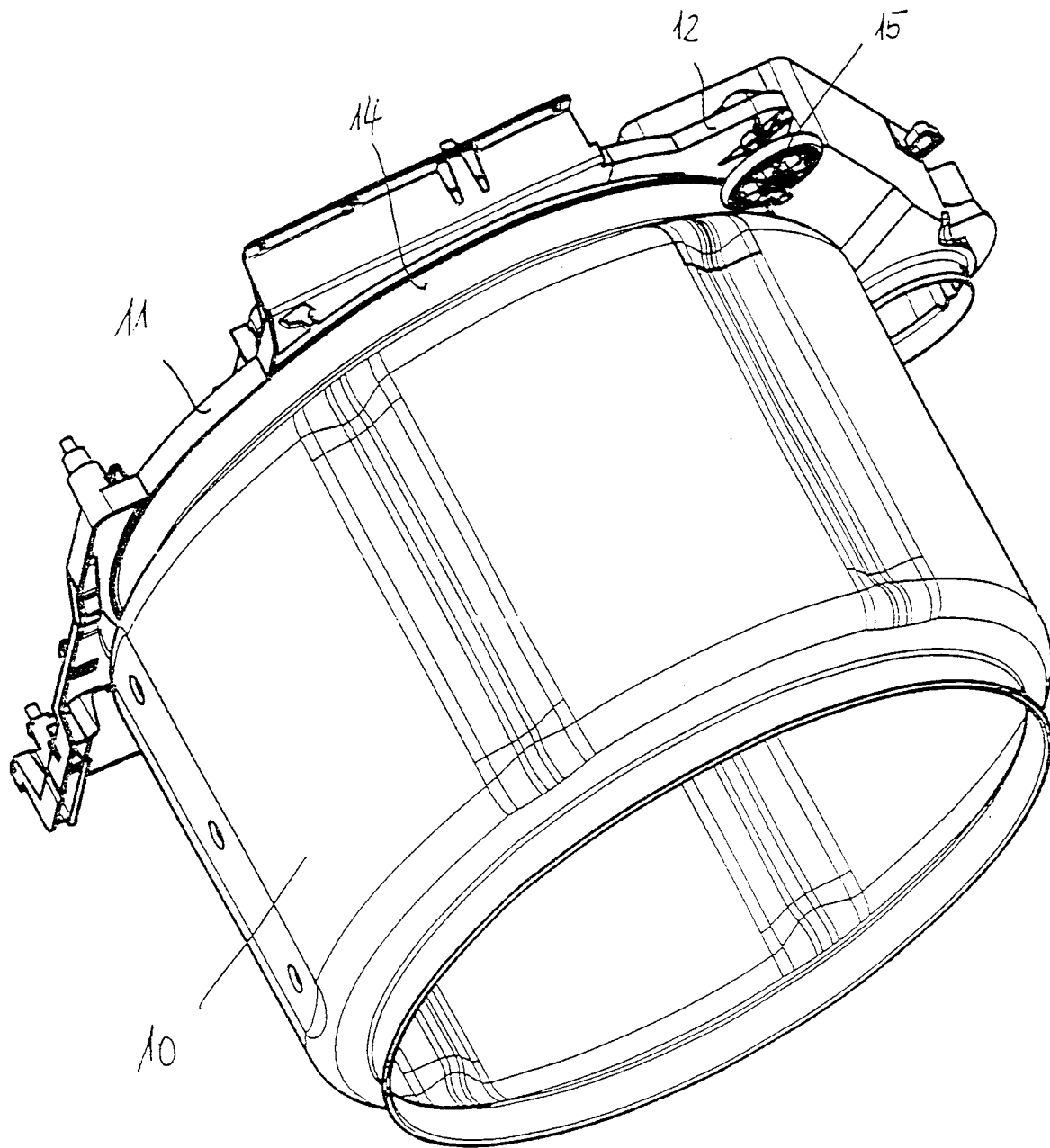


Fig. 1

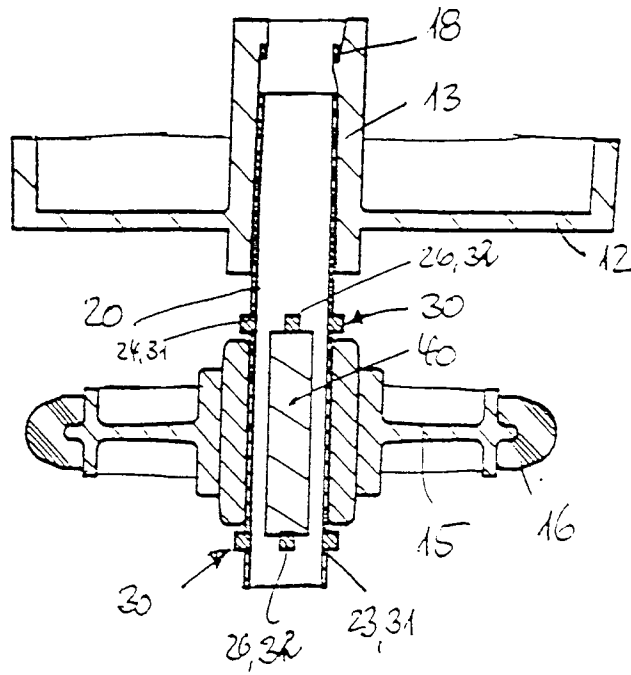


Fig. 5

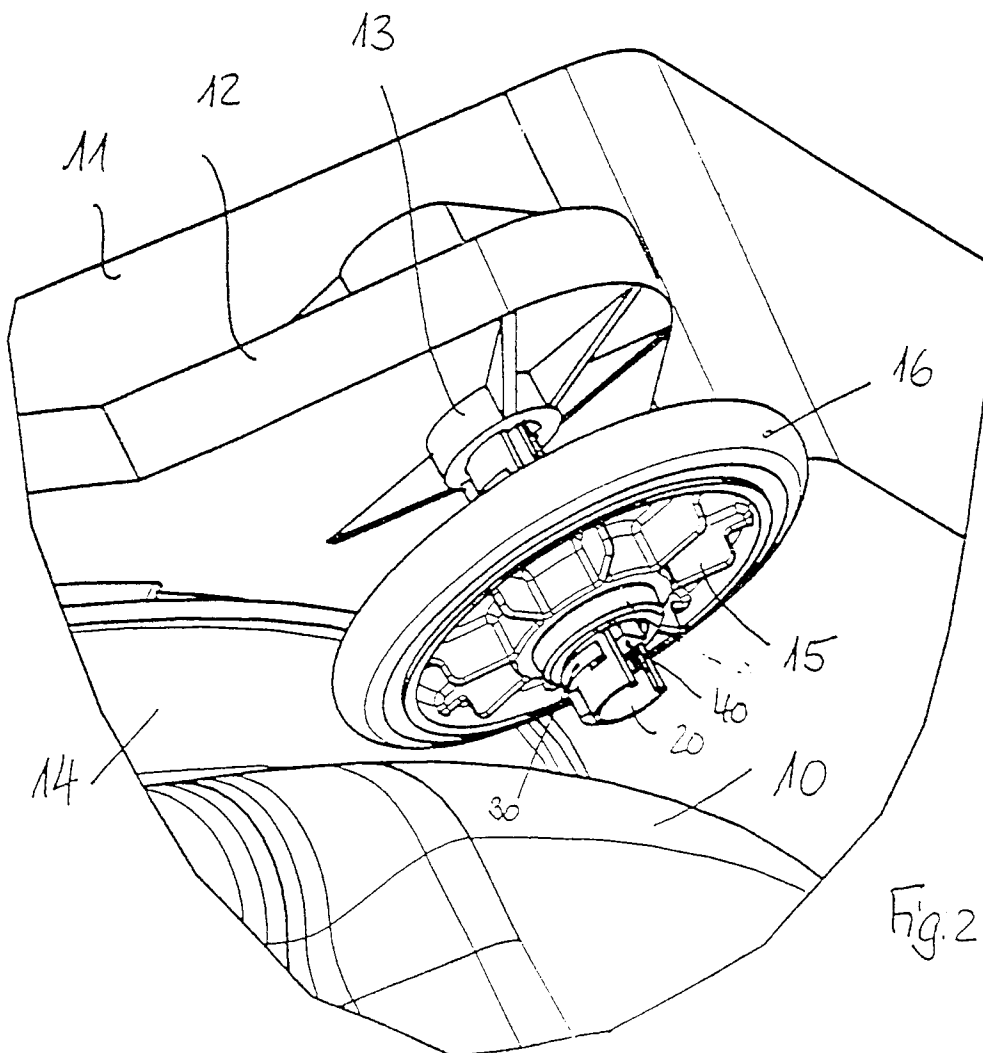


Fig. 2

