

PATENT SPECIFICATION

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(54) IMPROVEMENTS ON OR RELATING TO A SPIN-DRYER

(71) We, CALOR, a Body Corporate organized under the laws of France, of Place Ambroise Courtois, 69—Lyon 8°, France, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:

The present invention relates to a centrifugal spin drier of the type comprising a casing containing a basket intended to receive the laundry to be dried and driven in rotation from an electric motor. The basket and the casing are advantageously made from a plastics material.

A certain number of machines of the aforementioned type are already known, wherein the drier is either constituted by a revolving drum or basket of a washing machine; or is simply a basket rotated from an electric motor.

As far as the latter type of low cost spin drier is concerned, there is of course a tendency to improve the quality of the machine while at the same time reducing production costs, i.e. simplifying the mechanical design of the machine as much as possible, and complying with the requirements of pleasant appearance and compatibility with large-scale production.

According to the present invention there is provided a centrifugal spin drier including a casing containing a basket intended to receive laundry to be dried and which is rotatable by a shaft drivable by an electric motor, the basket, shaft and electric motor assembly being resiliently supported by a deflector plate fixed to the casing between the bottom thereof and the bottom of the basket, the bottom of the basket having a downwardly extending tubular member projecting therefrom and fitted over a sleeve member which is keyed fast to the shaft by means of a pin and which engages with the tubular member to drive the basket in

[Price 25p]

rotation, the external surfaces of the tubular member forming a frictional surface for engagement with mechanical braking means.

Particular embodiments of the invention will now be described, with reference to the accompanying drawings given solely by way of example wherein:

Figure 1 is a front view of a laundry spin-dryer as one embodiment of the invention, with parts broken away and parts shown in axial section;

Figure 2 is an enlarged view of the coupling of the electric-motor shaft to the bottom of the basket, modified according to a second embodiment of the invention;

Figure 3 is a sectional view upon the line III-III of Figure 2;

Figure 4 is a top view of the basket braking jaws; and

Figure 5 is a left-hand view of the braking jaws illustrated in Figure 4.

Figure 1 shows a general, partially broken-away view of one embodiment of a laundry spin-dryer, which includes a substantially cylindrical or slightly tapering basket 1 mounted within a casing or housing 2 resting upon legs 3 of rubber or like material, the casing 2 being provided at its top with a hinged door 4 which closes a casing opening above the open top portion 5 of the basket 1.

The basket 1, the casing 2 and the door 4 are advantageously made from a plastics material such as for instance polypropylene.

The basket 1 has a bottom 6 provided at its periphery with outlet holes (not shown) for the water removed from the laundry on rotation of the basket, the water being discharged from the casing 2 through a discharge orifice 7.

The basket 1 is rotatable about its axis by an electric motor 8 arranged in the housing 2 under the basket 1 and connected to the latter by its substantially vertical output shaft 9, connected, at one end, with

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the rotor 10 of the electric motor and, secured at the other end, to the bottom 6 of the basket 1. The motor 8 is isolated from the basket 1 by a plate 11 secured within the casing 2 by any appropriate means such as for instance screws, the plate 11 being slightly inclined towards the discharge orifice 7 in order to facilitate the outflow of water from the casing 2 and comprising a substantially central orifice 12 through which the shaft 9 passes with a certain clearance. The plate 11 therefore substantially divides the internal space of the casing into two distinct sections and enables basket 1 to be substantially isolated from motor 8.

It is to be noted that all the arrangements just described are generally known per se.

The basket, shaft and electric-motor assembly is supported by means of dumb-bell shaped members 13 of rubber or like material each connected at one end to the electric motor 8 and at the other end to the plate 11. Electric motor 8 advantageously has an annular flange 14 provided at its periphery with substantially circular holes in which the lower ends of the rubber members 13 are retained. In the embodiment illustrated in Figure 1, the rubber members 13 have at each end a narrower section 15 by which they are fitted in the holes provided respectively in the annular flange 14 of the motor and in the plate 11 interposed between the basket and the motor.

The motor shaft 9 is coupled to the bottom 6 of basket 1 by means of a very simple device which will now be described in detail.

In the first form of embodiment illustrated in Figure 1, the shaft 9 of the electric motor is connected to basket 1 by means of two half-members or half-shells 16 and 17 which are keyed to the shaft 9 by a pin 18 disposed in a transverse hole in the shaft 9 and which are fitted within a tubular projection 19 formed on the bottom 6 of basket 1. The tubular projection 19, which is vertical directed downwardly and located substantially at the centre of the basket bottom 6, is for instance cast integrally with the latter. Similarly to basket 1, the bottom 6 comprising the tubular projection 19 is advantageously made from a plastics material such as for instance polypropylene.

Each end of the pin 18 is inserted in a corresponding hole of the internal surface of the two half-shells 16 and 17 which thus engage each other around the shaft 9 and externally form a truncated cone which is fitted in the tubular projection 19. The internal surface of the tubular projection 19 forms a truncated cone complementary to that formed by the two half-shells 16 and 17 assembled around the shaft 9. Furthermore, the tubular projection 19 is pressed onto the two half-shells 16 and 17 by means of a washer 20 bearing upon the upper portion

of the basket bottom 6, the washer 20 being clamped by a nut 21 engaged with a screw-threaded end of shaft 9, the washer 20 and nut 21 being covered by a sealing ring 22 in order to completely close the basket 1 in the region where the tubular projection 19 opens.

The device just described is assembled as follows. The pin 18 is placed in the transverse hole in the upper end of shaft 9, the two half-shells 16 and 17 are fitted onto shaft 9, and the tubular projection 19 on the bottom 6 of basket 1 is then placed on the tapering sleeve formed by the half-shells 16 and 17. The washer 20 is then clamped against the basket bottom, by means of nut 21 thus ensuring the frictional element of the sleeve with the tubular projection 19 and enables the play to be taken up. The sealing ring 22 is then placed on the bottom 6 of basket 1.

In the second form of embodiment illustrated in Figures 2 and 3, the shaft 9 is connected to the bottom 6 of basket 1 by means of a substantially cylindrical and tubular double walled sleeve member 25 which is keyed to the shaft 9 by means of a pin 26 disposed in a transverse hole in the shaft 9 and is fitted in the tubular projection 27 formed on the basket bottom 6. As in the foregoing form of embodiment, the tubular projection 27 is cast integral with the bottom 6 of basket 1. Each end of the pin 26 is disposed in a transverse slot or hollow recess provided in the upper portion of the sleeve 25, the latter thus being secured to the shaft 9.

Furthermore, the sleeve 25 is provided at the outer periphery of its upper portion with a series of notches 28 which, in the example illustrated in Figures 2 and 3, are three in number and uniformly distributed around the periphery of the sleeve 25. The notches 28 co-operates with corresponding notches 29 which are provided on the internal surface of the upper portion of the tubular projection 27 and which are equal in number to the notches 28. In this form of embodiment, the sleeve 25 is made of metal but can also be made from a plastics material.

The device just described is assembled as follows: the pin 26 is placed in the transverse holes in the inner wall of the sleeve 25 and in the shaft 9 by passage through an access hole provided to this end in the outer wall of the sleeve 25. Then the basket 1 is mounted by means of its projection 27 on the shaft 9 and the sleeve 25, the series of notches 28 and 29 thus enabling the sleeve 25 to be locked in the tubular projection 27 and the basket 1 to be driven in rotation by the motor shaft 9.

In both the forms of embodiment described above, the motor shaft 9 is advantageously journaled in a sleeve 30 extending sub-

stantially vertically and fast with the stator of the electric motor 8, the sleeve 30 being for instance cast integrally with the aforementioned annular flange 14 in which are retained the suspension member 13. The shaft 9 is journaled in the sleeve 30 by means of, for instance, ball-bearings 31 and 32.

Moreover, braking means are provided enabling the rotation of the basket to be rapidly stopped when the electric motor is de-energised. The braking means are controlled by means of a pedal (not shown) located outside the casing 2.

The braking device comprises two members 35 and 36, substantially in the shape of half-circles, the respective corresponding ends 37 and 38 of which are pivotally interconnected by fastening means such as a rivet stud or a bolt 39 secured to an integrally-cast support member on plate 11. The other respective ends of the members 35 and 36 are interconnected by means of a spring 40 through which extends a flexible member 41, the spring 40 being disposed between the ends of the members 35 and 36, and the flexible member 41 being retained for instance at the end of the member 35 and taken out through a hole in the end of the member 36 and attached to a pedal outside the machine. According to one embodiment of the invention, the braking jaws formed by the members 35 and 36 are advantageously made from metal, for instance electrically zinc-plated metal-sheet, and, owing to the fact that the members 35 and 36 are placed around the lower end of the tubular projection 19 or 27 which is made from a plastics material such as polypropylene, a metal-on-plastics braking is thus obtained which gives excellent results.

The brake just described operates as follows: by acting upon the aforementioned pedal, the two ends of the members 35 and 36 interconnected by the spring 40 are moved nearer to one another, thus tightening the members 35 and 36 around the tubular projection formed on the bottom 6 of basket 1.

Of course, the invention is by no means limited to the forms of embodiment described and illustrated, which have been given by way of example only.

WHAT WE CLAIM IS:

1. A centrifugal spin drier including a casing containing a basket intended to receive laundry to be dried and which is rotatable by a shaft drivable by an electric motor, the basket, shaft and electric motor assembly being resiliently supported by a deflector plate fixed to the casing between the bottom thereof and the bottom of the basket, the bottom of the basket having a

downwardly extending tubular member projecting therefrom and fitted over a sleeve member which is keyed fast to the shaft by means of a pin and which engages with the tubular member to drive the basket in rotation, the external surfaces of the tubular member forming a frictional surface for engagement with mechanical braking means.

2. A centrifugal spin drier according to claim 1 wherein the sleeve member is formed of two half members the internal surfaces of which have a hole receiving the two ends of the key-pin respectively, the half-elements being thus assembled around the shaft and forming a truncated cone onto which a truncated cone formed by the internal surface of the tubular member is fitted.

3. A centrifugal spin drier according to claim 2 wherein said tubular member is pressed onto the two half members by means of a washer bearing upon the bottom of the basket and clamped by a nut, the washer and nut being covered by a sealing ring closing the basket in the region where the tubular member opens.

4. A centrifugal spin drier according to claim 1 wherein the sleeve member is a substantially cylindrical member having on its external periphery a series of notches co-operating with corresponding notches provided on the internal surface of the tubular member for rendering the latter coupled in rotation with the sleeve.

5. A centrifugal spin drier according to any one of the preceding claims wherein the braking means include two metal members extending around the tubular member which is made of plastics material such as polypropylene.

6. A centrifugal spin drier according to claim 5 wherein the members are pivotally secured together at one end at a fixed point by any appropriate means such as a rivet, stud, bolt or the like, whereas the other ends are interconnected through the medium of a spring through which is passed a flexible element adapted to tighten the members around the tubular member.

7. A centrifugal spin drier according to any one of the preceding claims wherein the shaft passes through a vertically extending guiding shaft connected to the rotor of the electric motor and including ball-bearings.

8. A centrifugal spin drier substantially as herein described with reference to and as illustrated in the accompanying drawings.

MEWBURN ELLIS & CO.
Chartered Patent Agents,
70-72 Chancery Lane,
London, WC2A 1AD

Agents for the Applicants



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downwardly extending tubular member projecting therefrom and fitted over a sleeve member which is keyed fast to the shaft by means of a pin and which engages with the tubular member to drive the basket in rotation, the external surfaces of the tubular member forming a frictional surface for engagement with mechanical braking means.

2. A centrifugal spin drier according to claim 1 wherein the sleeve member is formed of two half members the internal surfaces of which have a hole receiving the two ends of the key-pin respectively, the half-elements being thus assembled around the shaft and forming a truncated cone onto which a truncated cone formed by the internal surface of the tubular member is fitted.

3. A centrifugal spin drier according to claim 2 wherein said tubular member is pressed onto the two half members by means of a washer bearing upon the bottom of the basket and clamped by a nut, the washer and nut being covered by a sealing ring closing the basket in the region where the tubular member opens.

4. A centrifugal spin drier according to claim 1 wherein the sleeve member is a substantially cylindrical member having on its external periphery a series of notches co-operating with corresponding notches provided on the internal surface of the tubular member for rendering the latter coupled in rotation with the sleeve.

5. A centrifugal spin drier according to any one of the preceding claims wherein the braking means include two metal members extending around the tubular member which is made of plastics material such as polypropylene.

6. A centrifugal spin drier according to claim 5 wherein the members are pivotally secured together at one end at a fixed point by any appropriate means such as a rivet, stud, bolt or the like, whereas the other ends are interconnected through the medium of a spring through which is passed a flexible element adapted to tighten the members around the tubular member.

7. A centrifugal spin drier according to any one of the preceding claims wherein the shaft passes through a vertically extending guiding shaft connected to the rotor of the electric motor and including ball-bearings.

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