

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 1 270 792 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
05.01.2005 Bulletin 2005/01

(51) Int Cl.7: **D06F 57/04**, A45B 25/14

(21) Application number: **02254511.5**

(22) Date of filing: **27.06.2002**

(54) **Improvements relating to clothes driers**

Verbesserungen bezüglich Wäschetrockner

Améliorations concernant des séchoirs à linge

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE TR**

(30) Priority: **27.06.2001 GB 0115638**

(43) Date of publication of application:
02.01.2003 Bulletin 2003/01

(73) Proprietor: **Hills Industries Limited**
Caerphilly, Mid Glamorgan CF83 3HU (GB)

(72) Inventors:
• **Byard, Paul**
Pontypridd, Mid Glamorgan CF37 1QE (GB)

• **Beasley, Simon**
Penpedairheol, Hengoed CF82 8LA (GB)

(74) Representative:
James, Michael John Gwynne et al
Wynne-Jones, Lainé & James
22, Rodney Road
Cheltenham Gloucestershire GL50 1JJ (GB)

(56) References cited:
WO-A-01/14626 **DE-C- 19 804 608**
GB-A- 1 377 913

EP 1 270 792 B1

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

[0001] This invention relates to clothes driers. It concerns modifications applicable not only to the drier described in our International Application PCT/GB00/03254 (published as WO 01/14624 A), but to other rotary driers.

[0002] Figures 19 and 20 of that International Application show a wedging arrangement to help spread the arms at the start of the lifting process. A collar is drawn down towards the sleeve to which the lower ends of the arms are pivoted, and co-operates with wedge elements on the insides of the arms. Of course, after the initial downward movement of the collar, it reverses to go upwards with the sleeve while continuing for a while to act on the wedge elements. In the figures, a single part cord is shown, but it is suggested in the text that this could be doubled to form a purchase. However, while this eases the drawing together of collar and sleeve, the user still has to exert a considerable effort over the first part of the lift. Also, once the arms are fully raised, there is a long length of cord hanging down untidily.

[0003] It is the aim of this invention to reduce that effort and to have an automatic stowage of the tail of the cord at the end of the lift.

[0004] DE 19804608C discloses a cable operated mechanism for raising umbrella arms from a fixed mounting on the support column which includes an internal weight supported on the cable to draw the loose cable into the column.

[0005] According to the present invention there is provided a rotary drier having a column, support arms pivoted to a sleeve slidable up and down the column to be movable collectively between a retracted position alongside the column and a raised in-use position radiating outwardly and upwardly from near the top of the column, with lines between the arms that come taut when the arms are raised, wedge elements on the sides of the arms facing the column, a collar also slidable up and down the column, above the sleeve, and a draw cord coupling the collar and sleeve in a purchase arrangement enabling the collar and sleeve to be drawn towards each other, such that the collar co-operates with the wedge elements on the arms, whilst the sleeve is raised from its lowest position where the arms are retracted, so that the wedge elements cause the arms to pivot away from the retracted position, characterised in that the draw cord is additionally led up and down into the column, which is hollow, to suspend a mass therein, the cord run being such that, on each side, one end of the cord is fixed to the sleeve, the cord is taken up over a first sheave or smooth fairlead on the collar, then down under a second sheave or fairlead on the sleeve, up again past the collar to the top of the column, over a third sheave or fairlead there, down under a pulley suspending the mass within the column, up over a fourth sheave or fairlead at the top of the column, down to the sleeve again, and finally out to the user from a fifth

sheave or fairlead to a tail, such that the mass will be drawn to and arrested at the top of the column when the draw cord is pulled, further pulling of the cord easing the lift of the sleeve up the column, and wherein release of the cord when the sleeve is raised allows the mass to descend and thereby recover the tail of the cord to the sleeve.

[0006] For balance, to avoid the collar and/or sleeve binding on the column, this cord arrangement may be doubled, with symmetry with respect to one diameter of the column. The sleeve, at least, will generally have a key and groove engagement with the column so that it does not rotate about the column.

[0007] For a better understanding, some embodiments of the invention will now be described, by way of example, with reference to the accompanying drawing, in which:

Figure 1 is a composite elevation of parts of a rotary drier showing a purchase arrangement for assisting the raising of the arms, and

Figure 2 is an elevation of an alternative purchase arrangement.

[0008] The drier has an upright hollow column 1, a sleeve 2 slidable thereon and with support arms (not shown) pivoted thereto between pairs of lugs 3, and a slidable collar 4 above the sleeve which acts on wedge elements on the insides of the arms as described in PCT/GB00/03264. The sleeve 2 (and possibly also the collar 4) has a key and groove engagement with the column (not shown) to prevent rotation.

[0009] Two diametrically opposed sheaves 5 are mounted in a cap 6 that plugs the head of the column 1, a single sheave 7 on the collar 4 and two diametrically opposed sheaves 8 on the sleeve 2. A draw cord 9 is fixed to the sleeve at 10 and it is rove successively over the sheave 7, under one of the sheaves 8, over one of the sheaves 5, under a pulley 11 suspending a mass 12 within the column, over the other sheave 5 and under the other sheave 8, its free end being attached to a toggle 13. This cord and pulley arrangement could be duplicated in mirror image fashion, the pulley 11 being doubled and the toggle 13 being common to both cords.

[0010] Initially, with the arms folded against the column 1, the mass 12 will have dropped a short distance down the column by its own weight, pulling the toggle 13 up to the sleeve 2, where it jams against the other sheave 8. The toggle 13 is pulled out from there to open up the drier, but at first the only thing that happens is that the mass 12 is pulled up to the top of the column where it or the pulley 11 is arrested by a stop that may be provided by the underside of the dome of the cap 6. Alternatively, if the cap 6 has a higher dome than that shown, the cord will stretch directly across between the sheaves 5. Continued pull on the toggle now has the effect of a multi-part purchase, drawing the sleeve 2 and collar 4 together and lifting those elements up the col-

umn 1. The support arms are caused to be wedged away from the column 1 and their expansion continues as the sleeve 2 is raised up the column. By the time the sleeve 2 is secure at its uppermost position there is a long length of cord 9 leading from the sleeve to the toggle 13. But once that toggle is released, the mass 12 is free to drop and it descends to about where the sleeve 2 was with the arms 3 folded before being arrested by the toggle 13 arriving at the sheave 8.

[0011] It will be seen that this arrangement gives not only a mechanical advantage simultaneously with the drawing together of collar and sleeve and with the lifting of the sleeve up the column, but also a solution to the stowage of the draw cord once the operation is complete.

[0012] There could of course be less sheaves and a shorter cord for lightweight driers, or more sheaves and a longer cord to increase the mechanical advantage with a large, heavy drier, but the arrangement of Figure 1 should be sufficient for most purposes.

[0013] It will be seen that the sheaves 8 are centrally mounted on upstanding lugs 14 of generally triangular form with rounded vertices. The sheave 7 is on a downwardly depending lug 15 with a centrally indented lower edge, the sheave being offset to one side of the indent 16. There is a similar lug diametrically opposite which will also carry a sheave if the duplicated cord version is adopted. As the sleeve 2 and collar 4 are drawn together the vertices of the lugs 14 locate in the complementary indents 16 and prevent mutual rotation. This also ensures that there is a true short vertical lead between the sheaves 7 and 8 when the arms are fully raised and so the cord 9 should run freely back into the column 1.

[0014] These interengaging lugs may also be used in the draw cord arrangement of PCT/GB00/03254, where there is no cord retraction, as illustrated in Figure 2.

Claims

1. A rotary drier having a column (1), support arms pivoted to a sleeve (2) slidable up and down the column to be movable collectively between a retracted position alongside the column and a raised in-use position radiating outwardly and upwardly from near the top of the column, with lines between the arms that come taut when the arms are raised, wedge elements on the sides of the arms facing the column, a collar (4) also slidable up and down the column (1), above the sleeve (2), and a draw cord (9) coupling the collar and sleeve in a purchase arrangement enabling the collar and sleeve to be drawn towards each other, such that the collar cooperates with the wedge elements on the arms, whilst the sleeve is raised from its lowest position where the arms are retracted, so that the wedge elements cause the arms to pivot away from the retracted position, **characterised in that** the draw

cord is additionally led up and down into the column, which is hollow, to suspend a mass (12) therein, the cord run being such that, on each side, one end of the cord is fixed to the sleeve, the cord is taken up over a first sheave (7) or smooth fairlead on the collar, then down under a second sheave (8) or fairlead on the sleeve, up again past the collar to the top of the column, over a third sheave (5) or fairlead there, down under a pulley (11) suspending the mass within the column, up over a fourth sheave (5) or fairlead at the top of the column, down to the sleeve again, and finally out to the user from a fifth sheave (8) or fairlead to a tail, such that the mass will be drawn to and arrested at the top of the column when the draw cord is pulled, further pulling of the cord easing the lift of the sleeve up the column, and wherein release of the cord when the sleeve is raised allows the mass to descend and thereby recover the tail of the cord to the sleeve.

2. A rotary drier according to claim 1, wherein the cord arrangement is doubled, with symmetry with respect to one diameter of the column.
3. A rotary drier according to claim 1 or claim 2, wherein the sleeve has a key and groove engagement with the column so that it does not rotate about the column.
4. A rotary drier according to any one of claims 1 to 3, wherein the sleeve and the collar have facing complementary lug and indent configurations (14,15,16) to ensure interengagement of the sleeve and collar to prevent mutual rotation.
5. A rotary drier according to claim 4, where in the lugs (14,15) each have a sheave (8,7) mounted thereon over which the draw cord passes, such that there is a true lead between those two sheaves when the sleeve and the collar are interengaged.

Patentansprüche

1. Drehbarer Wäschetrockner mit einer Säule (1), Stützarmen, die schwenkbar an eine Hülse (2) angelenkt sind, die aufwärts und abwärts entlang der Säule verschiebbar ist zur kollektiven Bewegung zwischen einer zurückgezogenen Position entlang der Säule, und einer angehobenen Benutzungsposition, bei welcher die Arme in der Nähe der Spitze der Säule nach außen und oben tragen, wobei Leinen zwischen den Armen angeordnet sind, die gespannt werden, wenn die Arme angehoben sind, Keilelementen auf den Seiten der Arme, die der Säule zugewandt sind, einer Manschette (4), die ebenfalls entlang der Säule (1) auf und ab verschiebbar ist oberhalb der Hülse (2), sowie einem

Zugseil (9), welches die Manschette und die Hülse in einer Verkaufsordnung zusammenhält derart, dass die Manschette und die Hülse aufeinander zuziehbar sind derart, dass die Manschette mit den Keilelementen an den Armen kooperiert, während die Hülse von ihrer niedrigsten Positionen, in welcher die Arme zurückgezogen sind, angehoben wird, so dass die Keilelemente die Arme veranlassen, sich von der zurückgezogenen Position wegzuschwenken

dadurch gekennzeichnet,

dass das Zugseil zusätzlich in die Säule, die hohl ist, auf und ab geführt ist, zur Halterung einer Masse (12) hierin, wobei der Seilverlauf derart ist, dass auf jeder Seite ein Ende des Seiles an der Hülse befestigt ist, das Seil über eine erste Seilscheibe oder glatte Führungsrolle an der Manschette geführt ist, dann abwärts unter einer zweiten Seilscheibe oder Führungsrolle an der Hülse hindurchgeführt, erneut an der Manschette vorbei bis zur Spitze der Säule, dort über eine dritte Seilscheibe (5) oder Führungsrolle abwärts unter einer Umlenkrolle (11) hindurch, die die Masse innerhalb der Säule hält, aufwärts über eine vierte Seilscheibe oder Führungsrolle an der Spitze der Säule, erneut hinab zur Hülse und schließlich heraus zum Benutzer von einer fünften Seilscheibe (8) oder Führungsrolle zum Ende derart, dass die Masse zur Spitze der Säule gezogen und dort gehalten wird, wenn das Zugseil gezogen wird, wobei darüber hinaus das Ziehen des Seiles das Anheben der Hülse an der Säule entlang erleichtert, und wobei eine Freigabe des Seiles, wenn die Hülse angehoben wird, es der Masse gestattet, sich abwärts zu bewegen, und hierdurch das Ende des Seiles zur Hülse zurückholt.

2. Drehbarer Wäschetrockner gemäß Anspruch 1, wobei die Seilanordnung verdoppelt ist, unter Symmetrie in Bezug auf einen Durchmesser der Säule.
3. Drehbarer Wäschetrockner gemäß Anspruch 1 oder 2, wobei die Hülse in Keil- und Nuteingriff mit der Säule steht, so dass sie sich nicht um die Säule dreht.
4. Drehbarer Wäschetrockner gemäß einem der Ansprüche 1 bis 3, wobei die Hülse und die Manschette einander zugewandte komplementäre Vorsprungs- und Einbuchtungsausgestaltungen (14, 15, 16) besitzen, zur Sicherstellung des Eingriffes der Hülse und der Manschette, um eine gegenseitige Drehung zu verhindern.
5. Drehbarer Wäschetrockner gemäß Anspruch 4, wobei die Vorsprünge (14, 15) jeweils eine Seilscheibe (8, 7) tragen, die hieran montiert ist, über welche das Zugseil läuft, derart, dass sich eine echte Führung zwischen den beiden Seilscheiben er-

gibt, wenn die Hülse und die Manschette miteinander in Eingriff stehen.

5 Revendications

1. Séchoir rotatif ayant une colonne (1), des bras de support montés à pivotement sur un manchon (2) apte à monter et descendre la colonne par coulissement pour être déplaçables collectivement entre une position rétractée le long de la colonne et une position en utilisation, relevée, rayonnant vers l'extérieur et vers le haut à partir d'une position proche de la partie supérieure de la colonne, avec des fils entre les bras qui se tendent lorsque les bras sont relevés, des éléments de coin sur les côtés des bras tournés vers la colonne, un collier (4) également apte à monter et descendre la colonne (1) par coulissement, au-dessus du manchon (2), et une corde de traction (9) couplant le collier et le manchon dans un arrangement de palan permettant au collier et au manchon d'être tirés l'un vers l'autre, de telle sorte que le collier coopère avec les éléments de coin sur les bras, tandis que le manchon est relevé à partir de sa position la plus basse dans laquelle les bras sont rétractés, de telle sorte que les éléments de coin amènent les bras à s'éloigner de la position rétractée par pivotement, **caractérisé par le fait que** la corde de traction est en outre guidée vers le haut et vers le bas dans la colonne, qui est creuse, pour suspendre une masse (12) dans celle-ci, le parcours de la corde étant tel que, sur chaque côté, l'une des extrémités de la corde est fixée au manchon, la corde est enroulée sur une première poulie (7) ou guide-câble lisse sur le collier, puis descend sous une seconde poulie (8) ou guide-câble sur le manchon, remonte à nouveau en passant le collier à la partie supérieure de la colonne, passe sur une troisième poulie (5) ou un guide-câble à cet endroit, descend sous une poulie (11) à laquelle est suspendue la masse à l'intérieur de la colonne, remonte sur une quatrième poulie (5) ou guide-câble à la partie supérieure de la colonne, descend jusqu'au manchon à nouveau, et finalement sort vers l'utilisateur à partir d'une cinquième poulie (8) ou guide-câble jusqu'à une queue, de telle sorte que la masse sera tirée vers et arrêtée à la partie supérieure de la colonne quand la corde de traction est tirée, une traction supplémentaire de la corde facilitant le soulèvement du manchon remontant la colonne, et dans lequel le relâchement de la corde lorsque le manchon est relevé permet à la masse de descendre et de ce fait de rétablir la queue de la corde sur le manchon.
2. Séchoir rotatif selon la revendication 1, dans lequel le dispositif de corde est doublé, avec une symétrie par rapport à un diamètre de la colonne.

3. Séchoir rotatif selon la revendication 1 ou la revendication 2, dans lequel le manchon a un engagement par clé et rainure avec la colonne, de telle sorte qu'il ne peut pas tourner autour de la colonne.

5

4. Séchoir rotatif selon l'une quelconque des revendications 1 à 3, dans lequel le manchon et le collier ont des configurations à projection et échancrure (14,15,16) complémentaires, se faisant face, pour assurer un engagement réciproque du manchon et du collier afin d'éviter une rotation mutuelle.

10

5. Séchoir rotatif selon la revendication 4', dans lequel les projections (14,15) ont chacune une poulie (8,7) montée sur elles sur laquelle la corde de traction passe, de telle sorte qu'il y a un véritable guide entre ces deux poulies lorsque le manchon et le collier sont engagés réciproquement.

15

20

25

30

35

40

45

50

55



