



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
29.04.2009 Bulletin 2009/18

(51) Int Cl.:
D06F 37/30 (2006.01) D06F 58/08 (2006.01)

(21) Application number: **07119245.4**

(22) Date of filing: **25.10.2007**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK RS

(71) Applicant: **Electrolux Home Products Corporation N.V.**
1930 Zaventem (BE)

(72) Inventors:
• **Sartor, Luciano**
31015 Conegliano (IT)
• **Pillot, Sergio**
33087 Pasiano di Pordenone (IT)

(74) Representative: **Baumgartl, Gerhard Willi et al**
AEG Hausgeräte GmbH
Group Intellectual Property
90327 Nürnberg (DE)

(54) **Laundrying machine**

(57) A laundrying machine (1) having a drum (3); a motor (6) having an output shaft (8); a drive belt (13) looped about the output shaft (8) and the drum (3) to rotate the drum (3) about a first fixed axis (4); and a ten-

sioning device (14) for tensioning the belt (13), and having a pulley (15), which is fitted idly to a second fixed axis (17), is positioned contacting the belt (13) with a given contact pressure, and is elastically deformable radially.

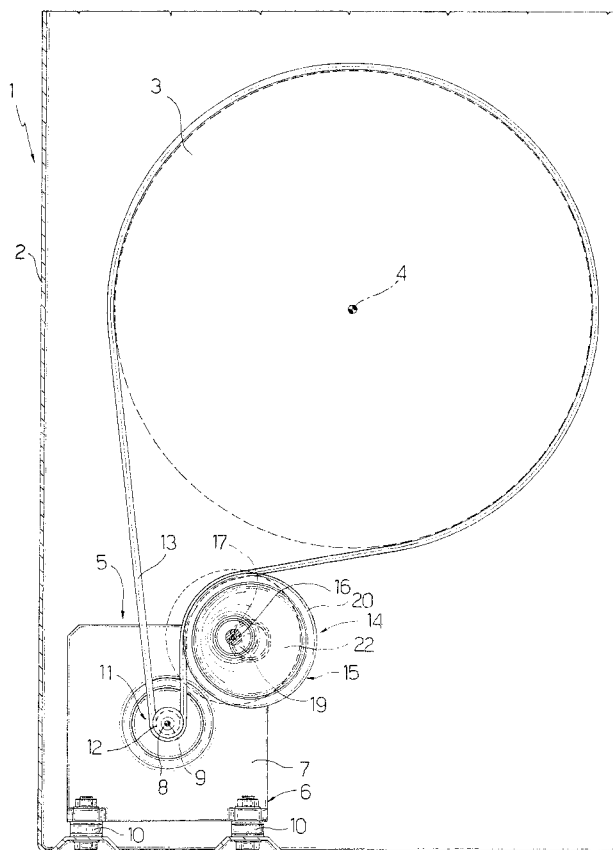


Fig.1

Description

[0001] The present invention relates to a laundering machine.

[0002] More specifically, the present invention relates to a laundering machine of the type comprising a casing; a drum fitted to the casing to rotate about a first fixed axis; and drum actuating means comprising a motor having an output shaft, and a belt drive having a belt looped about the output shaft of the motor and the drum to connect the drum angularly to the output shaft.

[0003] As is known, the drive belt of the drum of machines of the above type inevitably stretches with use, and must therefore be tensioned periodically by hand.

[0004] To avoid this, it has been proposed - as, for example, in GB 2078357 - to equip the machine with an automatic belt tension adjusting system to compensate for gradual stretch and keep the belt taut.

[0005] In GB 2078357, the belt is looped about the drum, and about a pulley fitted to the motor, eccentrically with respect to the motor output shaft axis, and connected angularly to the output shaft by a friction wheel. The motor is mounted for rotation, by means of bearings, on a support integral with the casing, and is rotated, together with the pulley, about the output shaft axis by a spring, which is stretched between the motor housing and the casing, and exerts a twisting moment to preload the motor housing.

[0006] This solution has the drawback of seriously complicating the structure of the machine by requiring a large number of component parts, e.g. the motor support, bearings, friction wheel, and spring.

[0007] It is an object of the present invention to provide a machine of the type described above, designed to keep the belt taut in a straightforward, low-cost manner.

[0008] According to the present invention, there is provided a laundering machine as claimed in Claim 1 and, preferably, in any one of the Claims depending directly or indirectly on Claim 1.

[0009] A number of non-limiting embodiments of the present invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 shows, with parts removed for clarity, a preferred embodiment of the machine according to the present invention;

Figure 2 shows a larger-scale detail of the Figure 1 machine;

Figure 3 shows a section, along line III-III, of the Figure 2 detail;

Figure 4 shows a larger-scale variation of the Figure 2 detail;

Figure 5 shows a section, along line V-V, of the Figure 4 detail.

[0010] Number 1 in Figure 1 indicates as a whole a laundering machine - in the example shown, a drier - comprising a casing 2; and a perforated laundry drum 3

fitted to casing 2 and rotated about a fixed axis 4 by an actuating device 5.

[0011] Actuating device 5 forms part of machine 1, and in turn comprises a motor 6 having a housing 7 fitted to casing 2 by elastic vibration-damping supports 10, and an output shaft 8 rotating (anticlockwise in Figure 1) about an axis 9 parallel to axis 4.

[0012] Actuating device 5 also comprises a belt drive 11 in turn comprising a pulley 12 fitted to output shaft 8, and a belt 13 looped about pulley 12 and drum 3 to connect drum 3 angularly to output shaft 8.

[0013] Machine 1 also comprises a tensioning device 14 for elastically and automatically compensating for variations in the length of belt 13, to keep belt 13 taut and ensure effective transmission of rotation between output shaft 8 and drum 3.

[0014] Tensioning device 14 comprises a pulley 15 which is fitted idly to a pin 16 connected rigidly to casing 2 and having a fixed axis 17 parallel to axis 9, and is pressed against the outer surface of the driven branch of belt 13, which winds partly about pulley 15 and rotates pulley 15 about axis 17 in the opposite direction to the rotation direction of output shaft 8.

[0015] As shown in Figure 1 and in more detail in Figures 2 to 5, pulley 15 comprises a tubular hub coaxial with axis 17 and defined by a bushing 18 fitted in rotary manner to pin 16, and by a body 19 made of rigid plastic material and fixed integrally to bushing 18, coaxially with axis 17. Pulley 15 also comprises an outer ring 20, also made of rigid plastic material, and which has a contoured peripheral surface defining a seat 21 for belt 13.

[0016] Pulley 15 also comprises, between body 19 and ring 20, an annular member 22 made of radially elastically deformable material, and which, in use, provides for keeping belt 13 at a constant tension substantially equal to the as-assembled tension of belt 13.

[0017] Accordingly, pulley 15 is fitted to casing 2 in a position in which, as shown in Figure 1, the pressure exerted by belt 13 on ring 20 deforms annular member 22, by compressing the portion of annular member 22 facing belt 13, thus moving ring 20 into an eccentric position with respect to axis 17.

[0018] The elastic reaction of annular member 22 is such as to elastically preload belt 13 sufficiently to keep belt 13 taut, immediately compensate for any stretch of belt 13, and so eliminate the need for periodic manual tensioning of belt 13.

[0019] In fact, as shown in Figure 1, an increase in the length of belt 13 inevitably reduces the pressure exerted by belt 13 on annular member 22 by means of ring 20, which is eased by annular member 22 into its normal position coaxial with axis 17 (as shown by the dash line) until the original preload condition is restored.

[0020] In the Figure 2 and 3 example, annular member 22 is defined by a tubular body made of layers of elastomeric material, and having a cylindrical inner surface connected integrally to body 19, and a cylindrical outer surface connected integrally to ring 20.

[0021] In the Figure 4 and 5 example, annular member 22 is defined by a compact layer of elastomeric material, which is connected integrally on the inside to body 19 and on the outside to ring 20, and has a built-in metal, preferably steel, ring 23.

5

[0022] In other embodiments not shown, annular member 22 may be made of any elastically deformable material.

[0023] In a variation not shown, pulley 15 is located inside the space defined by belt 13, and presses against the inner side of belt 13.

10

Claims

15

1. A laundering machine comprising a casing (2); a drum (3) fitted to the casing (2) to rotate about a first fixed axis (4); and actuating means (5) for operating the drum (3), and which comprise a motor (6) having an output shaft (8), and a belt drive (11) having a belt (13) looped about the output shaft (8) and the drum (3) to connect the drum (3) angularly to the output shaft (8); the machine (1) being **characterized in that** the motor (6) is fitted in a substantially fixed position to the casing (2); and **by** comprising a tensioning device (14) in turn comprising a pulley (15), which is fitted idly to a second fixed axis (17), is positioned contacting the belt (13) with a given contact pressure, and is elastically deformable radially.
2. A machine as claimed in Claim 1, wherein the motor (6) has a housing (7) connected in a substantially fixed position to the casing (2), and the second fixed axis (17) is defined by a pin (16) integral with the housing (7).
3. A machine as claimed in Claim 1 or 2, wherein the pulley (15) has a built-in annular member (22) made of elastically deformable material and extending about the second fixed axis (17).
4. A machine as claimed in one of the foregoing Claims, wherein the pulley (15) is mounted on a pin (16) coaxial with the second fixed axis (17), and comprises a rigid tubular body (19) fitted in rotary manner to the pin (16); a rigid outer ring (20) defining a seat (21) for the belt (13); and an annular member (22) made of elastically deformable material, extending about the second fixed axis (17), and interposed between the tubular body (19) and the outer ring (20).
5. A machine as claimed in Claim 3 or 4, wherein the annular member (22) comprises a tubular body of elastomeric material.
6. A machine as claimed in Claim 3 or 4, wherein the annular member (22) comprises a layer of elastomeric material incorporating a metal member (23).

20

25

30

35

40

45

50

55

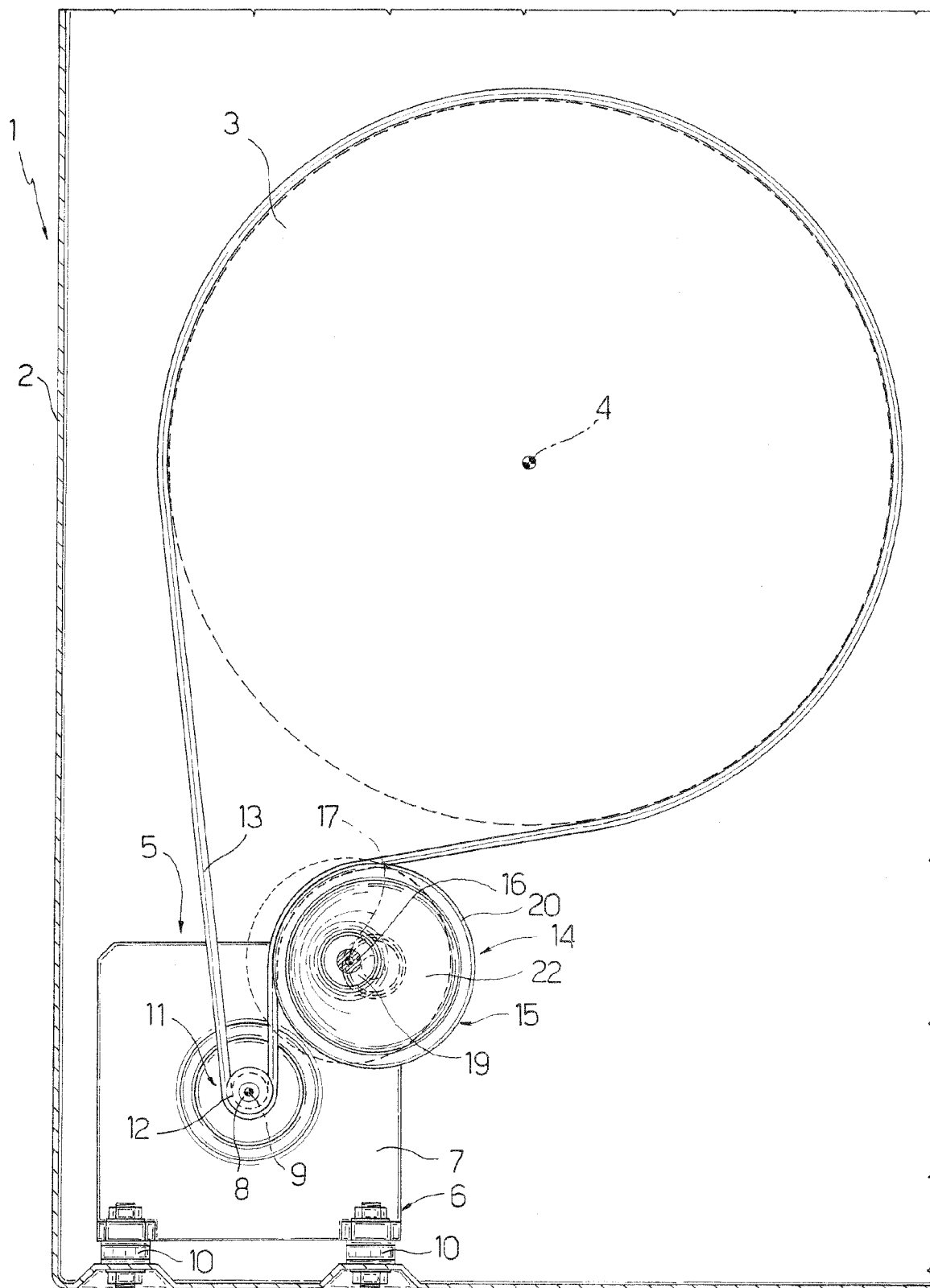


Fig.1

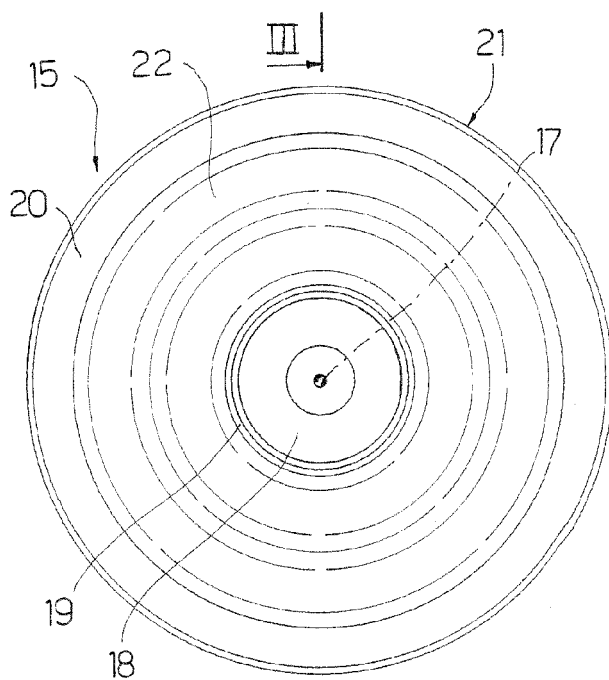


Fig. 2

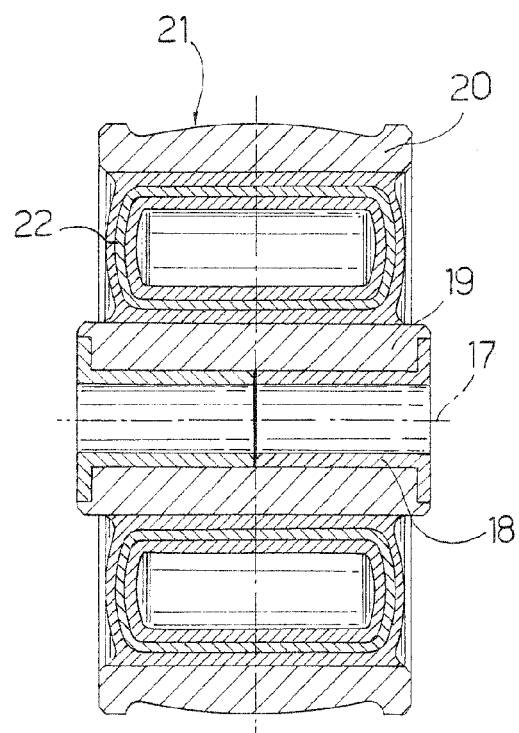


Fig. 3

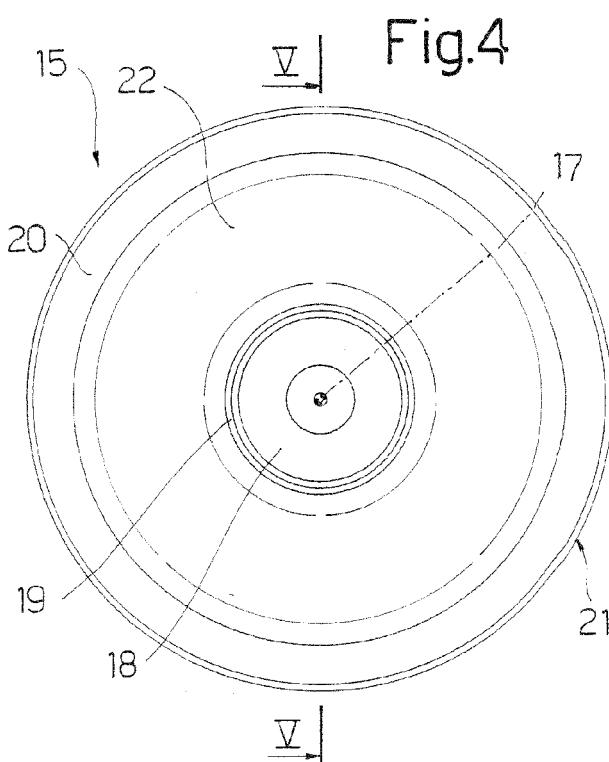


Fig. 4

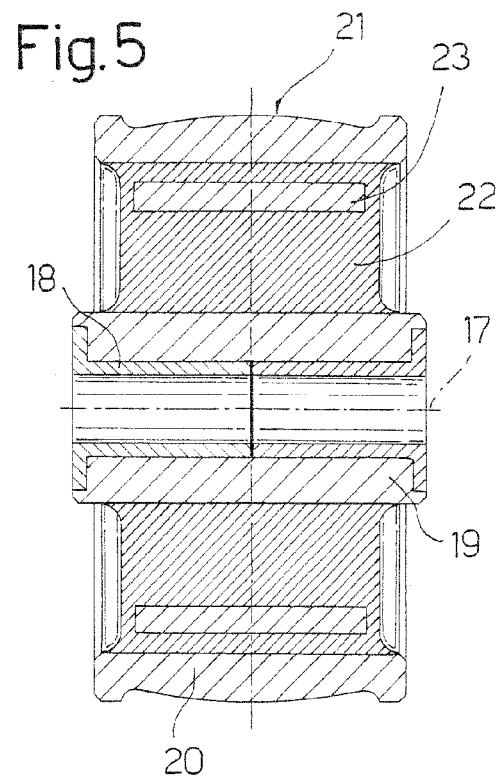


Fig. 5



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 11 9245

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 3 871 241 A (PESTKA JOHN AUGUST ET AL) 18 March 1975 (1975-03-18)	1,3	INV. D06F37/30 D06F58/08
A	column 1 lines 4-14; column 1, line 50 - column 3, line 2; claims 1-9; figures	2,4-6	
A,D	GB 2 078 357 A (BAUKNECHT GMBH G) 6 January 1982 (1982-01-06) * the whole document *	1-6	
A	GB 2 086 002 A (FISHER & PAYKEL) 6 May 1982 (1982-05-06) * the whole document *	1-6	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			D06F
Place of search		Date of completion of the search	Examiner
Munich		7 May 2008	Clivio, Eugenio
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

2
EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 07 11 9245

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

07-05-2008

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 3871241	A	18-03-1975	CA 995927 A1	31-08-1976

GB 2078357	A	06-01-1982	DE 8011829 U1	05-11-1981
			FR 2481722 A1	06-11-1981
			NL 8101969 A	16-11-1981
			SE 8102680 A	31-10-1981

GB 2086002	A	06-05-1982	AU 7556581 A	29-04-1982
			CA 1161282 A1	31-01-1984
			DE 3141384 A1	16-09-1982
			FR 2495258 A1	04-06-1982
			IT 1144988 B	29-10-1986
			JP 57127151 A	07-08-1982
			US 4407077 A	04-10-1983
			ZA 8106622 A	29-09-1982

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- GB 2078357 A [0004] [0005]