



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
26.10.2016 Bulletin 2016/43

(51) Int Cl.:
D06F 35/00 (2006.01)

(21) Application number: **15201346.2**

(22) Date of filing: **18.12.2015**

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**
Designated Extension States:
BA ME
Designated Validation States:
MA MD

(72) Inventors:
• **ULCAY, Gokce**
35090 Izmir (TR)
• **ULGUEL, Caner**
35535 Izmir (TR)

(74) Representative: **Cayli, Hülya**
Paragon Consultancy Inc.
Koza Sokak No: 63/2
GOP
06540 Ankara (TR)

(30) Priority: **22.04.2015 TR 201504966**

(71) Applicant: **Vestel Beyaz Eşya Sanayi ve Ticaret
A.Ş.**
45030 Manisa (TR)

(54) **A METHOD OF OPERATION FOR A WASHING MACHINE**

(57) The method of operation according to the present invention, which is suitable for use in a washing machine comprising at least one control unit, comprises the steps of initiating an allergy program which is effective against the factors on textile products that cause allergenic effects; introducing a washing liquid to the washing machine upon initiation of the application; heating the washing liquid to a first predetermined temperature (T1) value in the range of 63°C to 70°C; washing the textile products, at least once, with the washing liquid at the first

temperature (T1) value for a first predetermined time (s1) in the range of 55-70 minutes; discharging the washing liquid from the washing machine; introducing a rinsing water to the washing machine; heating the rinsing liquid to a second predetermined temperature (T2) value in the range of 30°C to 35°C; rinsing the textile products with the rinsing water at the second temperature (T2) value; discharging the rinsing water; repeating the rinsing process 4 to 6 times for a second predetermined time (s2) and terminating the allergy application.

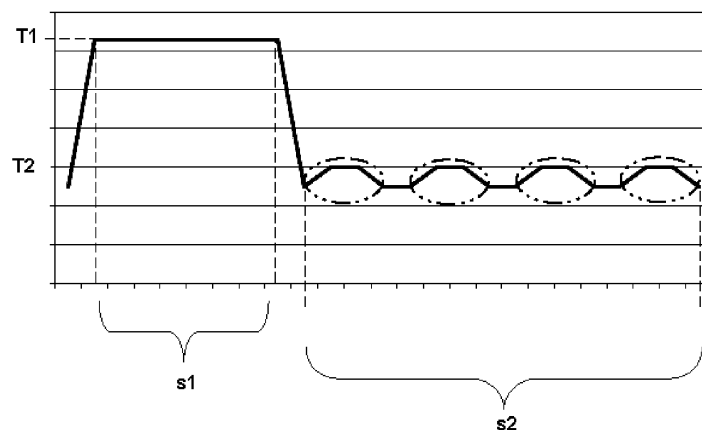


Figure 1

Description

Field of the Invention

[0001] The present invention relates to a method of operation for a washing machine, which is effective against factors formed on textile products and cause allergic, bacterial or microbial effects.

Background Art

[0002] Nowadays, many people are allergic to house dust mites (i.e. dust insect) living on textile products such as clothes, bed covers and sheets and to animals such as cats, dogs etc. and/or they are sensitive to such organisms as bacteria, fungi and mold. In particular, people with respiratory tract diseases as asthma have problems because of said factors on the textile products. Therefore, it is of utmost importance to remove said allergenic factors from the textile products.

[0003] One of the solutions to the said problem in the prior art is disclosed in CN101265655A. Said document discloses a laundry machine emitting ultraviolet light on the clothes that are being washed to perform sterilization, and a washing method for the laundry machine. Said method comprises the steps of selecting a washing program; activating an ultraviolet lamp; conveying a detergent and washing water; washing; rinsing; and closing the ultraviolet lamp to complete the washing process. However, said laundry machine requires an additional ultraviolet lamp, which increases production cost.

[0004] Another solution is disclosed in US2010083445A1. Said document discloses a laundry machine and a controlling method, which can remove allergens on the laundry. In the said method, steam is supplied on the laundry before washing in order to remove house dust mites on the laundry. Said laundry machine, however, requires an extra steam generator for generating steam, thus an economical laundry machine cannot be obtained.

Brief Description of the Invention

[0005] The method of operation according to the present invention, which is suitable for use in a washing machine comprising at least one control unit, comprises the steps of initiating an allergy program which is effective against the factors on textile products that cause allergic effects; introducing a washing liquid to the washing machine upon initiation of the application; heating the washing liquid to a first predetermined temperature value in the range of 63°C to 70°C; washing the textile products, at least once, with the washing liquid at the first temperature value for a first predetermined time in the range of 55-70 minutes; discharging the washing liquid from the washing machine; introducing a rinsing water into the washing machine; heating the rinsing liquid to a second predetermined temperature value in the range of 30°C

to 35°C; rinsing the textile products with the rinsing water at the second temperature value; discharging the rinsing water; repeating the rinsing process 4 to 6 times for a second predetermined time and terminating the allergy application.

[0006] With the method of operation according to the present invention, invisible allergenic organisms such as microbes, bacteria, house dust mites, fungi and molds on textile products such as pillows, blankets and clothes are totally destroyed and removed from the textile products. Thus, the need to use an additional material to disinfect the laundry is eliminated and a washing machine may be produced which is usable, economical and reliable.

Object of the Invention

[0007] An object of the present invention is to provide a method of operation for a washing machine, which removes allergenic factors on textile products such as microbes, bacteria, house dust mites, fungi and molds.

[0008] Another object of the present invention is to provide a method of operation for a washing machine, which eliminates the need to use an additional material to disinfect the laundry. Another object of the present invention is to provide a washing machine which is usable, economical and reliable.

Description of the Drawings

[0009] An embodiment of the method of operation for a washing machine according to the present invention is illustrated in the accompanying drawing, wherein;

Figure 1 is a graphical representation of an illustrative embodiment of the method according to the present invention.

[0010] All the parts illustrated in the drawings are individually assigned a reference numeral and the corresponding terms of these numbers are listed as follows:

First temperature	(T1)
Second temperature	(T2)
First time	(s1)
Second time	(s2)

Description of the Invention

[0011] Various invisible allergenic organisms such as microbes, bacteria, house dust mites, fungi and molds may live on bed textile products such as pillows and blankets as well as the clothes. In particular, body of the people with diseases as asthma may negatively react to said organisms, which makes the life of said people difficult. Although there exist in the prior art washing machines designed to solve said problem and sensitive cleaning

programs implemented by these machines, said programs typically require to use an additional chemical and/or to provide the washing machines with additional components such as a steam generator, ultraviolet emitting lamps etc. This increases production cost of the said machines. Therefore, with the present invention, there is provided a method of operation for a washing machine which removes allergenic organisms on the laundry, without requiring an additional material.

[0012] The method of operation according to the present invention, which is illustrated in figure 1 and is suitable for use in a washing machine comprising at least one control unit, and which comprises the steps of initiating an allergy program which is effective against the factors on textile products that cause allergenic effects; introducing a washing liquid (which may either be water that is directly received from the mains or water containing a cleaning agent such as detergent, stain remover etc.) to the washing machine upon initiation of the application; also comprises the following steps in the order given: heating the washing liquid to a first predetermined temperature (T1) value in the range of 63°C to 70°C; washing the textile products, at least once, with the washing liquid at the first temperature (T1) value for a first predetermined time (s1) in the range of 55-80 minutes (particularly 55-70 minutes); discharging the washing liquid from the washing machine; introducing a rinsing water (which may either be water that is directly received from the mains or water containing a cleaning agent such as softener etc.) into the washing machine; heating the rinsing liquid to a second predetermined temperature (T2) value in the range of 28°C to 35°C (particularly 30°C to 35°C); rinsing the textile products with the rinsing water at the second temperature (T2) value; discharging the rinsing water; repeating the rinsing process 4 to 6 times for a second predetermined time (s2) (preferably in the range of 80-150 minutes, particularly 80-95 minutes); and terminating the allergy application.

[0013] With the method of operation according to the present invention, if it is desired from the washing machine, in the cleaning process of textile products, to remove various allergenic organisms such as microbes, bacteria, house dust mites, fungi and molds, the method is activated in the washing machine including said method of operation, for example by means of a button provided on the washing machine. Then, washing liquid is introduced into the washing machine and the washing liquid is heated until its temperature reaches to a first predetermined temperature (T1) which is in the range of 63°C to 70°C. Thereafter, textile products are washed at this first temperature (T1) for a first time (s1) in the range of 55-80 minutes. In the process of washing at this high temperature, the washing liquid contacts every point of the textile products and permeates into any surface of the textile products. Thus, allergic organisms that are present on any point of the textile products are destroyed. After the washing process, the washing liquid is discharged and some of the dead organisms are thus dis-

charged. After the discharge of the washing liquid, rinsing liquid is now introduced into the washing machine and the rinsing liquid is heated until its temperature reaches to a second predetermined temperature (T2) that is in the range of 30°C to 35°C. Then, textile products are rinsed at the second temperature (T2), the rinsing water is discharged after the rinsing, the rinsing water is again introduced into the washing machine and heated until it reaches to the second temperature (T2) and the textile products are again rinsed. After 4 to 6 rinsing processes are performed, allergy application is terminated (the duration of the rinsing processes may be same or different from each other). With the method of operation according to the present invention, allergic organisms are removed from the textile products without requiring any additional materials, and thus a usable, economical and reliable washing machine may be obtained.

[0014] In relation with the said invention, tests conducted by National Pollen and Aerobiology Research Unit at the University of Worcester have also confirmed that the method of the invention is 100% successful. Said tests are conducted on cat, dog pollen, house dust mite allergens, living house dust mites, bacteria and fungi that are commonly present on textile products, which tests are performed such that after the test samples having thereon cat, dog pollen, house dust mite allergens, living house dust mites, bacteria and fungi are washed with the inventive method, a reduction in the amount of said allergens, mites, bacteria and fungi is measured. At first, the amount of allergens, mites, bacteria and fungi on four different points (i.e. outer surface, inner side etc.) of each sample is detected and then the samples are washed with the said method by means of a washing machine using the above-described method. After the washing, the amount of allergens, mites, bacteria and fungi on said four different points of each sample is again measured and it is determined that the amount of allergens, mites, bacteria and fungi is lower than the limit that may be measured by the measuring device. Thus, it is detected that the method of operation reduces the amount of allergens, mites, bacteria and fungi with 100% yield. In other words, it is detected that all of the allergens, mites, bacteria and fungi on each sample are destroyed and removed from the sample entirely.

[0015] With the method of operation according to the present invention, invisible allergenic organisms such as microbes, bacteria, house dust mites, fungi and molds on textile products such as pillows, blankets and clothes are totally destroyed and removed from the textile products. Thus, the need to use an additional material to disinfect the laundry is eliminated and a washing machine may be produced which is usable, economical and reliable.

Claims

1. A method of operation which is suitable for use in a

washing machine comprising at least one control unit and which comprises the steps of initiating an allergy program which is effective against the factors on textile products that cause allergenic effects; and introducing a washing liquid to the washing machine upon initiation of the application, **characterized by** comprising the following steps in the order given;

- heating the washing liquid to a first predetermined temperature (T1) value in the range of 63°C to 70°C; 10
 - washing the textile products, at least once, with the washing liquid at the first temperature (T1) value for a first predetermined time (s1) in the range of 55-70 minutes; 15
 - discharging the washing liquid from the washing machine;
 - introducing a rinsing water to the washing machine;
 - heating the rinsing liquid to a second predetermined temperature (T2) value in the range of 30°C to 35°C; 20
 - rinsing the textile products with the rinsing water at the second temperature (T2) value;
 - discharging the rinsing water; 25
 - repeating the rinsing process 4 to 6 times for a second predetermined time (s2); and
 - terminating the allergy application.
2. A method of operation according to claim 1, **characterized in that** said washing liquid is water that is directly received from the mains. 30
 3. A method of operation according to claim 1, **characterized in that** said washing liquid is water containing a cleaning agent. 35
 4. A method of operation according to claim 1, **characterized in that** said rinsing liquid is water that is directly received from the mains. 40
 5. A method of operation according to claim 1, **characterized in that** said rinsing liquid is water containing a cleaning agent. 45
 6. A method of operation according to claim 1, **characterized in that** said second time (s2) is in the range of 80-95 minutes.
 7. A method of operation according to claim 1, **characterized in that** it is activated by means of button provided on the washing machine. 50

55

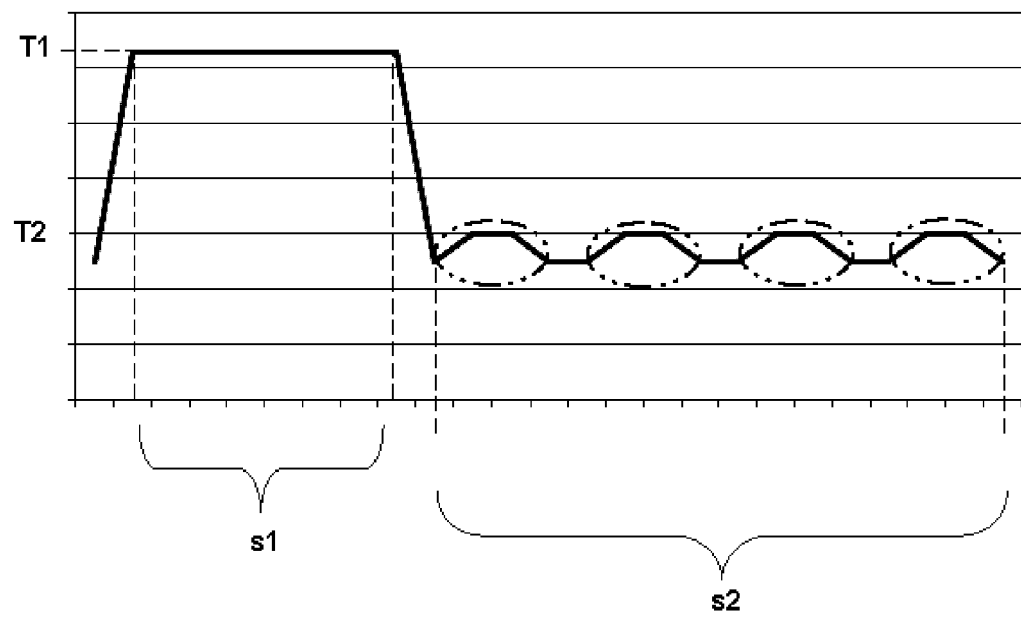


Figure 1



EUROPEAN SEARCH REPORT

 Application Number
 EP 15 20 1346

5

10

15

20

25

30

35

40

45

50

55

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A,D	US 2010/083445 A1 (KIM PYOUNG HWAN [KR] ET AL) 8 April 2010 (2010-04-08) * the whole document *	1-7	INV. D06F35/00
A,D	CN 101 265 655 A (NANJING LG PANDA APPLIANCES CO [CN]) 17 September 2008 (2008-09-17) * the whole document *	1-7	
A	US 2014/208523 A1 (KIM SUNMI [KR] ET AL) 31 July 2014 (2014-07-31) * figure 8 *	1-7	
			TECHNICAL FIELDS SEARCHED (IPC)
			D06F
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 2 September 2016	Examiner Stroppa, Giovanni
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			

 1
 EPO FORM 1503 03.02 (P04C01)

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

EP 15 20 1346

5

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.

02-09-2016

10

15

20

25

30

35

40

45

50

55

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 2010083445	A1	08-04-2010	AU 2007234511 A1	03-04-2008
			BR PI0713753 A2	06-11-2012
			CA 2654472 A1	13-03-2008
			CN 101374988 A	25-02-2009
			CN 104652081 A	27-05-2015
			EP 2061922 A2	27-05-2009
			JP 5539721 B2	02-07-2014
			JP 2010502357 A	28-01-2010
			KR 20080041143 A	09-05-2008
			RU 2009113007 A	20-10-2010
			US 2010083445 A1	08-04-2010
			US 2014007354 A1	09-01-2014
			WO 2008030066 A2	13-03-2008

CN 101265655	A	17-09-2008	NONE	

US 2014208523	A1	31-07-2014	AU 2014200548 A1	14-08-2014
			CN 103966800 A	06-08-2014
			JP 5844830 B2	20-01-2016
			JP 2014147781 A	21-08-2014
			KR 20140098484 A	08-08-2014
			US 2014208523 A1	31-07-2014

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

- CN 101265655 A [0003]
- US 2010083445 A1 [0004]