

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
3 January 2002 (03.01.2002)

PCT

(10) International Publication Number  
**WO 02/00989 A1**

- (51) International Patent Classification<sup>7</sup>: **D06F 43/00**, 95/00
- (21) International Application Number: PCT/GB01/02811
- (22) International Filing Date: 26 June 2001 (26.06.2001)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
0015778.4 28 June 2000 (28.06.2000) GB
- (71) Applicant (for all designated States except MN, US): **RECKITT BENCKISER N.V.** [NL/NL]; Kantoorgebouw de Appelaer, Fruittuinen 2-12, NL-2132 NZ Hoofddorp (NL).
- (71) Applicant (for MN only): **RECKITT BENCKISER (UK) LIMITED** [GB/GB]; 103-105 Bath Road, Slough, Berkshire SL1 3UH (GB).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): **FRANZOLIN, Giorgio** [IT/IT]; Via Tommaseo, 45, I-30035 Mirano, VE (IT).
- (74) Agents: **BROWN, Andrew, Stephen** et al.; Reckitt Benckiser plc, Group Patents Dept., Dansom Lane, Hull HU8 7DS (GB).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).
- Published:**  
— with international search report  
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.



**WO 02/00989 A1**

(54) Title: AN INFLATED BAG FOR CLEANING CLOTHES

(57) Abstract: This invention relates to a process for cleaning and/or refreshing soiled fabric article(s) by placing the soiled fabric article(s), together with a cleaning composition, into a bag, sealing the bag, placing the bag into the drum of a laundry washing machine, inflating the bag and running a wash cycle on the washing machine. The invention also relates to a fabric cleaning and/or refreshing kit.

An Inflated Bag for Cleaning Clothes

This invention relates to a process for cleaning and/or refreshing soiled fabric article(s) by placing the soiled fabric article(s), together with a cleaning composition, into a bag, sealing the bag, placing the bag into the drum of a laundry washing machine, inflating the bag and running a wash cycle on the washing machine. The invention also relates to a fabric cleaning and/or refreshing kit.

Typically, there are two different methods of cleaning fabrics, namely, first, by immersing and agitating the fabrics in an aqueous washing medium including detergent, typically in a laundry washing machine, usually referred to as "laundry washing", and, second, in particular for specific kinds of fabrics, by using non-aqueous solvents in a specific process usually referred to as "dry cleaning".

In dry cleaning, various hydrocarbon and halocarbon solvents, such as trichloroethylene or perchloroethylene, have been used as a cleaning medium to dissolve or disperse soils. Such solvents typically exhibit a high evaporation rate so that they readily volatilize after their application and can easily be recovered. One of the most inconvenient disadvantages of a dry cleaning process is that it is limited to commercial cleaning operations, which employ expensive specialized equipment. Thus, the consumer is not able to clean or refresh his garments by himself, which is not only inconvenient, but also costly. Moreover, the use of organic solvents having such high

volatility tends to release vapours, which are deleterious to human health. Although there is a strict control of commercial dry cleaning operations, many consumers are reluctant to use such services for ecological considerations.

Various processes for dry cleaning processes to be carried out in the home have been proposed in the art

U.S. Pat. No. 3,432,253 is directed to a dry cleaning process which involves placing in an air impermeable bag a fabric to be cleaned and a quantity of dry cleaning agent, sealing the bag to confine therein the fabric, the cleaning agent and a quantity of cushioning air to help preventing wear of the fabric to be cleaned, tumbling the bag to cause the cleaning agent to clean the fabric, removing the cleaned fabric from the bag, and removing the cleaning agent from the fabric.

GB 1 598 911 is directed to a method for cleaning garments comprising the steps of placing the fabrics in a perforated flexible bag, sealing the perforated bag and the fabric contained therein in a liquid-impermeable flexible bag containing a dry cleaning solvent, and agitating the second bag and its content in a drum of a domestic washing or drying machine.

U.S. Pat. No. 4,336,024 is directed to a home dry cleaning process and formulations useful in such process. This method comprises the steps of applying to the textile material a quantity of cleaning agent comprising an organic solvent, placing an absorbent sheet in contact

with the textile material, covering the surface of the absorbent sheet not in contact with the textile material within an impermeable sheet, forming the impermeable sheet into a closed system encompassing the absorbent sheet and the textile material, in particular forming the impermeable sheet into a bag-like structure, spinning such closed system on the interior surface of the drum of a washing machine to enable the cleaning agent to migrate into the absorbent sheet, and removing the textile material from the closed system.

PCT Application WO 93/23603 discloses a dry cleaning kit for in-dryer use comprising a plastic bag to enclose in vapour-impermeable manner a soiled fabric, and a fabric-cleaning article, comprising a porous substrate sheet impregnated with a gelled cleaning composition, as well as a process for the use of this kit by placing the soiled fabric article and the fabric-cleaning article into the plastic bag, closing and sealing the bag, tumbling the bag in a hot air dryer, and removing the cleaned fabric article from the bag.

U.S. Pat. No. 5,865,851 discloses a very similar home dry cleaning process and in particular a specifically useful dry cleaning composition to be used with such process.

A number of U.S. Patents, in particular U.S. Pat. Nos. 5,547,476, 5,630,847, and 5,630,848, are directed to an in-home dry cleaning process, as well as to related formulations, comprising the steps of placing the fabrics to be cleaned and the cleaning composition within a

flexible plastic bag, closing and sealing the bag,  
placing said bag in a rotating apparatus, rotating the  
bag for a specific time period, and removing the fabrics  
from the bag. The preferred rotating apparatus for this  
5 process is a hot air dryer. However, also a laundry  
washing machine could be used.

Although these prior art documents illustrate  
various alternative approaches for home dry cleaning,  
10 they still have some shortcomings and limitations.

In particular, none of those processes is  
specifically designed for the use in the normal washing  
cycle of a laundry washing machine. As the number of hot  
15 air dryers present in the home is still low in most  
countries, a specifically designed process and system for  
use in an automatic washing machine would be extremely  
useful due to the larger numbers of such machines found  
in the home.

20

Thus, it is an object of the invention to provide a  
process for cleaning, preferably water-free cleaning, at  
home specifically adapted for use with a laundry washing  
machine.

25

According to the first aspect of the present  
invention there is provided a process for cleaning and/or  
refreshing soiled fabric article(s) comprising, or  
preferably consisting essentially of;

30

the following two steps in either order

1) placing the soiled fabric article(s) into a gas  
and water impermeable bag so that the fabric article(s)

are in contact with the inside surface of the bag and a cleaning or refreshing composition, and

2) placing the bag into the drum of a laundry washing machine, and

5 3) sealing the bag,

4) inflating the bag with a gas to an extent that it will occupy a major portion of the volume of the drum,

5) running a wash cycle of the laundry washing machine,

10 6) and removing the cleaned or refreshed fabric article(s) from the bag.

Advantageously, the bag is inflated to occupy substantially all of the volume of the drum.

15

In a preferred embodiment, the bag is inflated by introducing gas into the bag. The gas is ideally air which is forced into the bag, for example, by means of a manual or powered pump.

20

In a further preferred embodiment the gas simultaneously serves as a carrier for introducing at least a portion, preferably all of the cleaning composition into the bag.

25

According to a second aspect of the present invention there is provided a fabric cleaning or refreshing kit comprising, preferably consisting essentially of: (a) one bag made of gas and water  
30 impermeable flexible material having at least one opening to introduce soiled fabric article(s), a sealing system to seal the opening after introduction of the soiled

fabric article(s), and means to inflate the bag; and (b) at least one cleaning and/or refreshing composition.

In a preferred embodiment of the kit, the means for inflating the bag is a one-way valve adapted to be connected to an air or gas supply, and, optionally an air pump or compressed gas, preferably air.

Advantageously the cleaning and/or refreshing composition is already provided in the bag, ideally in the form of a solid or a liquid, or can be added to bag prior to sealing the bag as a solid or liquid. After sealing the bag the composition can be added in the form of an aerosol or other system comprising a gaseous carrier which is introduced into the bag. When the composition is in the form of a liquid this may be added as is or within a rupturable container. The container will rupture either when subjected to agitation in the wash cycle of the washing machine or exposed to elevated temperatures of 45°C to 95°C found in the machine wash cycle of the washing machine. The composition may contain components in the form which will evaporate at temperatures of 45°C to 90°C found in the wash cycle, for example perfumes or solvents, allowing for an even spread onto the fabric.

Surprisingly, the inflation of the bag filled with the fabrics to be cleaned, after the insertion of the bag into the drum of a conventional domestic laundry washing machine, allows the cleaning or refreshing process to be run in the normal cycle of the washing machine in a very

simple and effective way providing numerous advantages over the prior art processes.

When using a normal washing cycle of conventional  
5 laundry washing machines a reduction in the water consumption is achieved without taking any special measures. Laundry washing machines normally control the amount of incoming water with the aid of sensors situated at a certain level in the cuvette of the machine. As the  
10 inflated bag occupies a major portion, and preferably all of the volume of the drum of the laundry washing machine, this level is reached with only a fraction of the water that would be required in the absence of the inflated bag. First results have shown that the amount of water  
15 consumed was reduced to between 35 and 50 % of the normal water consumption.

When inflating the bag in the drum of the laundry washing machine, the walls of the bag will be pressed to  
20 the interior walls of the drum so that both the bag and the drum will rotate integrally. This will specifically ensure a very effective tumbling of the fabrics, which is a factor well known for effecting an appropriate cleaning or refreshing performance, which is sometimes difficult  
25 to achieve with the processes of the prior art.

A further advantage of an inflated bag is that it will prevent uneven distribution of the weight load in the drum. Finally, maximising the volume of the bag and  
30 therefore its surface also maximises a heat transfer from the heated water into the interior of the bag. Moreover, using the normal washing cycle of a laundry washing

machine with heated water results in a more even heat transfer to the surface of the bag and avoids any "hot spots" which may occur when using a hot air dryer. Thus, requirements of the choice for the material of the bag are less restricted, although very similar material as known from prior art can be used, in particular polyethylene.

An important aspect of the present invention is that the bag is formed from a material which is both gas and water impermeable to ensure that the gas remains within the bag to hold the inflated state and maintain the concentration of cleaning agent(s) during the process, and to avoid leakage of water into the bag as this would be detrimental in a dry cleaning procedure.

In the process according to the present invention the bag filled with the soiled fabric article(s) to be cleaned and/or refreshed will have to be inserted into the drum of the laundry washing machine in a non-inflated (or at least not fully inflated) state in order to facilitate entry into the machine. Although there may be different means to inflate the bag after insertion into the drum which are encompassed by the present invention, a preferred way would be a one-way valve in the wall of the bag which can be connected to an air or gas supply to introduce air or gas into the bag to inflate it to its final state.

In a preferred embodiment of the invention, the gas to inflate the bag could simultaneously serve as a carrier for introducing at least a portion of the

cleaning composition into the bag. Thus, the cleaning and/or refreshing composition could be provided for in the form of an aerosol or other system comprising a gaseous carrier. By inflating the bag with such gaseous system, loaded with the cleaning and/or refreshing composition, this cleaning and/or refreshing composition could be added to the system in a very effective way, improving the even distribution of the composition within the volume of the bag and onto the fabric articles.

Moreover, adding the cleaning and/or refreshing composition in this specific form will avoid to use the usual means for supplying such composition, namely a support (towellette or others) having absorbed thereon the cleaning and/or refreshing composition. This specific way of adding the cleaning and/or refreshing composition would not only permit a more even distribution and allow the cleaning and/or refreshing composition to start acting from the moment of dosage, but will also avoid direct contact of the fabrics with the concentrated compositions as present on the usual support which may cause damages to the fabrics by decoloration, spotting, etc.

The features disclosed in the foregoing description, and/or in the claims may, both separately and in any combination thereof, be material for realising the invention in diverse forms thereof.

**Claims**

1. A process for cleaning and/or refreshing soiled fabric article(s) comprising;
- 5 the following two steps in either order
- 1) placing the soiled fabric article(s) into a gas and water impermeable bag so that the fabric article(s) are in contact with the inside surface of the bag and a cleaning or refreshing composition, and
- 10 2) placing the bag into the drum of a laundry washing machine, and
- 3) sealing the bag,
- 4) inflating the bag with a gas to an extent that it will occupy a major portion of the volume of the drum,
- 15 5) running a wash cycle of the laundry washing machine,
- 6) and removing the cleaned or refreshed fabric article(s) from the bag.
- 20 2. The process according to claim 1, wherein the bag is inflated to occupy substantially all of the volume of the drum.
3. The process according to claim 1 or 2, wherein the
- 25 bag is inflated by introducing gas into the bag.
4. The process according to claim 3, wherein the gas simultaneously serves as a carrier for introducing at least a portion of the cleaning composition into
- 30 the bag.

5. The process according to claim 4, wherein the gas serves as a carrier for all of the cleaning composition.
- 5 6. A fabric cleaning or refreshing kit comprising, preferably consisting essentially of: (a) one bag made of gas and water impermeable flexible material having at least one opening to introduce soiled fabric article(s), a sealing system to seal the opening after introduction of the soiled fabric article(s), and means to inflate the bag; and (b) at least one cleaning and/or refreshing composition.
- 10
7. The kit according to claim 6, wherein the means for inflating the bag is a one-way valve adapted to be connected to an air or gas supply.
- 15
8. The kit according to claim 6 or 7, wherein the cleaning and/or refreshing composition is provided in the form of an aerosol or other system comprising a gaseous carrier.
- 20

## INTERNATIONAL SEARCH REPORT

Intern~~ational~~ Application No

PCT/GB 01/02811

A. CLASSIFICATION OF SUBJECT MATTER  
 IPC 7 D06F43/00 D06F95/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
 IPC 7 D06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 1 598 911 A (GOMM K) 23 September 1981 (1981-09-23) cited in the application claims 1-3	1,6
A	US 3 432 253 A (DIXON PETER RAY ET AL) 11 March 1969 (1969-03-11) cited in the application claim 1	1,6
A	US 5 238 587 A (SMITH JAMES A ET AL) 24 August 1993 (1993-08-24) claims 8,19	1,6
A	US 5 951 716 A (LUCIA III FRANK ANTHONY ET AL) 14 September 1999 (1999-09-14) claims 1,13,20	1,6
	-/--	



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

° Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \* & \* document member of the same patent family

Date of the actual completion of the international search

15 October 2001

Date of mailing of the international search report

23/10/2001

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
 NL - 2280 HV Rijswijk  
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
 Fax: (+31-70) 340-3016

Authorized officer

D'Souza, J

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 01/02811

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6 024 767 A (LUCIA III FRANK ANTHONY ET AL) 15 February 2000 (2000-02-15) claims 1,3,22 -----	1,6

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 01/02811

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
GB 1598911	A	23-09-1981	NONE		
US 3432253	A	11-03-1969	NONE		
US 5238587	A	24-08-1993	CA	2135746 A1	25-11-1993
			DE	9321584 U1	24-08-2000
			EP	0640156 A1	01-03-1995
			JP	3171339 B2	28-05-2001
			JP	7509629 T	26-10-1995
			WO	9323603 A1	25-11-1993
US 5951716	A	14-09-1999	AU	703588 B2	25-03-1999
			AU	6284296 A	22-01-1997
			AU	704991 B2	13-05-1999
			AU	6284396 A	22-01-1997
			AU	709497 B2	02-09-1999
			AU	6387496 A	22-01-1997
			BR	9608605 A	02-03-1999
			BR	9608658 A	08-09-1999
			BR	9608977 A	29-06-1999
			CA	2224692 A1	09-01-1997
			CA	2224693 A1	09-01-1997
			CA	2224794 A1	09-01-1997
			EP	0843603 A1	27-05-1998
			EP	0842318 A2	20-05-1998
			EP	0833976 A1	08-04-1998
			GB	2302553 A ,B	22-01-1997
			GB	2302878 A ,B	05-02-1997
			GB	2302879 A ,B	05-02-1997
			WO	9700993 A1	09-01-1997
			WO	9700738 A1	09-01-1997
			WO	9700990 A2	09-01-1997
			ZA	9605282 A	29-01-1997
US 6024767	A	15-02-2000	AU	703588 B2	25-03-1999
			AU	6284296 A	22-01-1997
			AU	704991 B2	13-05-1999
			AU	6284396 A	22-01-1997
			AU	709497 B2	02-09-1999
			AU	6387496 A	22-01-1997
			BR	9608605 A	02-03-1999
			BR	9608658 A	08-09-1999
			BR	9608977 A	29-06-1999
			CA	2224692 A1	09-01-1997
			CA	2224693 A1	09-01-1997
			CA	2224794 A1	09-01-1997
			EP	0843603 A1	27-05-1998
			EP	0842318 A2	20-05-1998
			EP	0833976 A1	08-04-1998
			GB	2302553 A ,B	22-01-1997
			GB	2302878 A ,B	05-02-1997
			GB	2302879 A ,B	05-02-1997
			WO	9700993 A1	09-01-1997
			WO	9700738 A1	09-01-1997
			WO	9700990 A2	09-01-1997
			ZA	9605281 A	23-07-1997