

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

THOMSON, ANDREW J.
2300 Winchester Road
Neenah, Wisconsin 54956 (US)

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing (day/month/year)	02/09/2019
-------------------------------------	------------

Applicant's or agent's file reference 65051784PC02	FOR FURTHER ACTION See paragraph 2 below
---	--

International application No. PCT/US2019/034798	International filing date (day/month/year) 31/05/2019	Priority date (day/month/year) 31/05/2018
--	--	--

International Patent Classification (IPC)
G06Q 10/06 (2012.01)

Applicant
KIMBERLY-CLARK WORLDWIDE, INC.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1 (a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- ☒ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examination Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/SG  Intellectual Property Office of Singapore 1 Paya Lebar Link, #11-03 PLQ 1, Paya Lebar Quarter Singapore 408533 Email: pct@ipos.gov.sg	Date of completion of this opinion 30/08/2019 (day/month/year)	Authorized officer Lai Tan Lei Tanny (Dr) IPOS Customer Service Tel. No.: (+65) 6339 8616
---	--	--

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US2019/034798

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:
 - ☒ the international application in the language in which it was filed.
 - ☐ a translation of the international application into _____ which is the language of a translation furnished for the purpose of international search (Rules 12.3(a) and 23.1 (b)).
2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(b)).
3. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:
 - a. ☐ forming part of the international application as filed:
 - ☐ in the form of an Annex C/ST.25 text file.
 - ☐ on paper or in the form of an image file.
 - b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.
 - c. ☐ furnished subsequent to the international filing date for the purposes of international search only:
 - ☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).
 - ☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).
4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US2019/034798

Box No. II Priority

1. ☐ The validity of the priority claim has not been considered because the International Searching Authority does not have in its possession a copy of the earlier application whose priority has been claimed or, where required, a translation of that earlier application. This opinion has nevertheless been established on the assumption that the relevant date (Rules 43*bis*.1 and 64.1) is the claimed priority date.
2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

The priority of claims 1-18 is valid.

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US2019/034798

Box No. V Reasoned statement under Rule 43bis.(1)(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	9, 16 AND 18	YES
	Claims	1-8, 10-15 AND 17	NO
Inventive step (IS)	Claims	NONE	YES
	Claims	1-18	NO
Industrial applicability (IA)	Claims	1-18	YES
	Claims	NONE	NO

2. Citations and explanations:

The following citations are referred to in this written opinion. Full bibliographic details are provided in the International Search Report:

- D1 – CN 106193226 A
(the original non-English language document was used for the purpose of establishing the written opinion)
- D2 – KR 10-2015-0127426 A
(a machine translation was used for the purpose of establishing the written opinion)
- D3 – CN 105404194 A
(the original non-English language document was used for the purpose of establishing the written opinion)
- D4 – CN 106184261 A
(the original non-English language document was used for the purpose of establishing the written opinion)

D1-D4 are directed at systems for maintenance of toilets.

1. Novelty

Claims 1-8, 10-15 and 17 are not novel and therefore do not comply with PCT Article 33(2).

Claims 9, 16 and 18 are novel and therefore comply with PCT Article 33(2).

Claims 1-8 and 10-15

Each of D1 and D2 discloses (using the wording of claim 1):

A washroom management system (D1: Paragraphs [0005]-[0007]; D2: Page 6 second paragraph) comprising:

- a functional sensor configured to generate operability level data for a washroom component defining a status of the washroom component (D1: Paragraph [0014] – *when the electricity is switched on, the system assesses water tank level, electricity*; D2: Page 8 first paragraph – *second sensor that detects water level in toilet*);
- a controller configured to modify an operation of the washroom component, wherein the washroom component has a normal operation state, an issue resolution state and a disabled state with the normal operation state being normal function of the washroom component, the issue resolution state being for performing maintenance on the washroom component and the disabled state being for disabling the washroom component from functioning (D1: Paragraph [0014] – *toilet is deemed to be in working condition, automated maintenance mode, or to require maintenance personnel*; D2: Page 8 second and third paragraphs, page 10 first paragraph, page 13 last paragraph - page 14 first paragraph – *blockage detected, manager informed of clog, control unit may change toilet to “blocking” mode to limit use of toilet when toilet is clogged*); and
- a central management system configured to access the operability level data, communicate with the controller and evaluate the operability data to determine an actionable event type for the washroom component, wherein the actionable event type comprises an automated resolution event and an assisted resolution event, (D1: Paragraph [0014] – *automated maintenance mode triggered, but if problem cannot be solved, maintenance personnel will be contacted*; D2: Page 10 first paragraph, page 14 third paragraph – *manager can be informed of clog, water may be continuously supplied when*

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US2019/034798

Box No. V Reasoned statement under Rule 43bis.(1)(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement

toilet is clogged) and the central management system is further configured to:

- in response to determining the actionable event type is the automated resolution event, cause the controller to put the washroom component into the issue resolution state for a predetermined time period or sequence and then putting the washroom component to one of the normal operation state or disabled state based on evaluating the operability level data after the issue resolution state (D1: Paragraph [0016] – **if toilet is clogged, flushing cycle started, if problem cannot be solved, maintenance personnel will be contacted**; D2: Page 14 third paragraph – **when toilet is clogged, water may be continuously supplied**); and
- in response to determining the action event type is the assisted resolution event, cause the controller to leave the washroom component in the normal operation state or put the washroom component into the disabled state, based on operability level data, and causing a message to be sent to a washroom attendant to service the washroom component (D1: Paragraph [0016] – **low deodorant level, maintenance personnel contacted**; D2: Page 10 first paragraph – **manager informed of clog**).

Therefore, claim 1 is not novel.

Each of D1 and D2 discloses (using the wording of claim 10):

A method comprising:

- accessing operability data from a sensor specifying a status of a washroom component (D1: Paragraph [0014] – **when the electricity is switched on, the system assesses water tank level, electricity**; D2: Page 8 first paragraph – **second sensor that detects water level in toilet**);
- analyzing the operability data to determine an actionable event type for the washroom component, wherein the actionable event type comprises an automated resolution event and an assisted resolution event (D1: Paragraph [0014] – **automated maintenance mode triggered, but if problem cannot be solved, maintenance personnel will be contacted**; D2: Page 10 first paragraph, page 14 third paragraph – **manager can be informed of clog, water may be continuously supplied when toilet is clogged**);
- in response to determining the actionable event type is the automated resolution event, directing the washroom component to enter the issue resolution state and then directing the washroom component to enter one of the normal operation state or disabled state based on an evaluation of the operability level data after the issue resolution state (D1: Paragraph [0016] – **if toilet is clogged, flushing cycle started, if problem cannot be solved, maintenance personnel will be contacted**; D2: Page 14 third paragraph – **when toilet is clogged, water may be continuously supplied**); and
- in response to determining the action event type is the assisted resolution event, and directing the washroom component to enter the normal operation state or the disabled state, based on an evaluation of the operability level data (D1: Paragraph [0016] – **low deodorant level, maintenance personnel contacted**; D2: Page 10 first paragraph – **manager informed of clog**).

Therefore, claim 10 is not novel.

The additional features of claims 2-8 and 11-15 have also been disclosed in D1 and/or D2 as detailed below.

Claim 11 : in response to determining the action event type is the assisted resolution event comprises directing a message to be sent to a washroom attendant to service the washroom component (D1: Paragraph [0016] – **low deodorant level, maintenance personnel contacted**; D2: Page 10 first paragraph – **manager informed of clog**)

Claims 2 and 12 : the washroom component comprises one of a paper towel dispenser, a urinal, a toilet, bath tissue dispenser, a faucet, a soap dispenser, and a sanitizer dispenser (D1: Paragraphs [0014]-[0016]; D2: Page 8 first paragraph)

Claims 3 and 13 : the functional sensor comprises at least one of a consumable product level sensor, a water flow sensor, a flush valve sensor, and a motor current sensor (D1: Paragraphs [0014]-[0016]; D2: Page 8 first paragraph)

Claims 4 and 14 : from the automated resolution event and in response to putting the washroom component in the disabled state comprises causing a message to be sent to a washroom attendant to service the washroom component (D1: Paragraphs [0014]-[0016]; D2: Page 10 first paragraph, page 13 last paragraph - page 14 first paragraph – **manager informed of clog, control unit can change toilet to “blocking” mode to limit use of toilet when toilet is clogged**)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US2019/034798

Box No. V Reasoned statement under Rule 43bis.(1)(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement

- Claim 5 : the assisted resolution event is refilling the washroom component with consumable product (D1: Paragraph [0016] – *low deodorant level triggers maintenance, implicit that deodorant is being refilled*)
- Claim 6 : the issue resolution state comprises actuating the washroom component one or more times (D1: Paragraph [0016] – *flushing cycle started*; Page 14 third paragraph – *when toilet is clogged, water may be continuously supplied*)
- Claim 7 : the washroom component comprises a toilet or urinal, the functional sensor comprises a flush valve sensor and a water flow sensor, and evaluating the operability data comprises determining, in response to a flush valve actuation from the flush valve sensor, a water flow reading from the water flow sensor and comparing the water flow reading to a predetermined water flow parameter (D1: Paragraph [0016])
- Claim 8 : the predetermined time period or sequence for the issue resolution state comprises causing the toilet or urinal to flush a specified number of times (D1: Paragraph [0016] – *flushing cycle started*)
- Claim 15 : analyzing the operability data comprises determining the washroom component is jammed or partially clogged and determining the actionable event type is the automated resolution event type (D1: Paragraph [0016] – *if toilet is clogged, flushing cycle started*; D2: Page 14 third paragraph – *when toilet is clogged, water may be continuously supplied*)

Therefore, claims 2-8 and 11-15 are not novel.

Claim 17

D1 discloses (using the wording of claim 17):

A method comprising:

- accessing first operability data from a first sensor specifying consumable product use from a first washroom component and second operability data from a second sensor specifying an operational state of a second washroom component (D1: Paragraphs [0014]-[0016] – *clogged toilet detected, other triggers include low water level in water tank, low deodorant level*);
- analyzing the first and second operability data to determine an actionable event type for the washroom, wherein the actionable event type comprises an automated resolution event and an assisted resolution event and the analyzing comprises determining high consumable product use from the first washroom component and determining a low operational state for the second washroom component (D1: Paragraphs [0014]-[0016] – *clogged toilet detected, other triggers include low water level in water tank, low deodorant level*);
- in response to determining the actionable event type is the automated resolution event, directing a washroom component in the washroom to enter one of the normal operation state or disabled state based on an evaluation of the operability level data after the issue resolution state (D1: Paragraphs [0016], [0024] – *if toilet is clogged, flushing cycle started, system attempts to self-repair, if problem cannot be solved, maintenance personnel will be contacted*); and
- in response to determining the action event type is the assisted resolution event, and directing the washroom component to enter the normal operation state or the disabled state, based on an evaluation of the operability level data (D1: Paragraphs [0014]-[0016] – *trigger for maintenance can be low level of deodorant, maintenance personnel required*).

Therefore, claim 17 is not novel.

Claims 9, 16 and 18

Claims 9, 16 and 18 are novel as none of the prior art documents fully discloses all the features of any of these claims in one single document.

2. Inventive step

Claims 1-18 do not involve an inventive step and therefore do not comply with PCT Article 33(3).

Box No. V Reasoned statement under Rule 43bis.(1)(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement

Claims 1-8, 10-15 and 17

Given the above novelty objection, claims 1-8, 10-15 and 17 do not involve an inventive step.

Notwithstanding the lack of novelty, claims 1 and 10 are also not inventive in view of D3.

D3 discloses (using the wording of claim 1, strikethrough wordings refer to features that are not disclosed in D1):

A washroom management system (D3: Paragraphs [0004], [0040] – **automated monitoring system**) comprising:

- a functional sensor configured to generate operability level data for a washroom component defining a status of the washroom component (D3: Paragraph [0011] – **data collected from sensors**);
- a controller configured to modify an operation of the washroom component, wherein the washroom component has a normal operation state, an issue resolution state and a disabled state with the normal operation state being normal function of the washroom component, the issue resolution state being for performing maintenance on the washroom component and the disabled state being for disabling the washroom component from functioning (D3: Paragraphs [0009], [0011], [0041], [0061] – **when a fault is detected, the component would be put into protection state, when component is deemed to be not working, the smart controller stops the component from working**); and
- a central management system configured to access the operability level data, communicate with the controller and evaluate the operability data to determine an actionable event type for the washroom component, wherein the actionable event type comprises ~~an automated resolution event and an assisted resolution event~~, (D3: Paragraphs [0009], [0041], [0061] – **when a fault is detected, the component would be put into protection state, a fault code would be sent to the server indicating need for maintenance or repair**) and the central management system is further configured to:
 - ~~in response to determining the actionable event type is the automated resolution event, cause the controller to put the washroom component into the issue resolution state for a predetermined time period or sequence and then putting the washroom component to one of the normal operation state or disabled state based on evaluating the operability level data after the issue resolution state; and~~
 - in response to determining the action event type is the assisted resolution event, cause the controller to leave the washroom component in the normal operation state or put the washroom component into the disabled state, based on operability level data, and causing a message to be sent to a washroom attendant to service the washroom component (D3: Paragraphs [0009], [0041], [0061] – **when a fault is detected, the component would be put into protection state, a fault code would be sent to the server indicating need for maintenance or repair**).

The difference between claim 1 and D3 is the determination of automated resolution event, which is not disclosed in D3. However, toilet maintenance systems which can attempt to automatically repair issues are common in the art (see D1: Paragraphs [0014]-[0016]; D2: Page 14 third paragraph – **when toilet is clogged, water may be continuously supplied**; D4: Paragraphs [0005], [0010]-[0012] – **the toilet goes into self-maintenance wherein the waste is processed according to type and the toilet is flushed continuously**). Therefore, claim 1 is not inventive in view of D3 read alone.

Notwithstanding the lack of novelty, claim 10 is also not inventive in view of D3. Similar to claim 1, the difference between claim 10 and D3 is the determination of automated resolution event, which is not disclosed in D3. As discussed earlier, toilet maintenance systems which can attempt to automatically repair issues are common in the art (see discussion for claim 1 in view of D3). Therefore, claim 10 is not inventive in view of D3 read alone.

The additional features of claims 2, 3, 5 and 11-13 have also been disclosed in D3 as detailed below.

Claims 2 and 12 : the washroom component comprises one of a paper towel dispenser, a urinal, a toilet, bath tissue dispenser, a faucet, a soap dispenser, and a sanitizer dispenser (D3: Paragraphs [0012], [0014], [0016]-[0020]);

Claims 3 and 13 : the functional sensor comprises at least one of a consumable product level sensor, a water flow sensor, a flush valve sensor, and a motor current sensor (D3: Paragraphs [0012], [0014], [0016]-[0020])

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US2019/034798

Box No. V Reasoned statement under Rule 43bis.(1)(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement

Claim 5 : the assisted resolution event is refilling the washroom component with consumable product (D3: Paragraph [0046] – *when liquid level in dispenser is lower than a threshold, server is prompted to send signal to maintenance department*)

Claim 11 : in response to determining the action event type is the assisted resolution event comprises directing a message to be sent to a washroom attendant to service the washroom component (D3: Paragraphs [0009], [0041], [0061] – *when a fault is detected, the component would be put into protection state, a fault code would be sent to the server indicating need for maintenance or repair*)

Therefore, notwithstanding the lack of novelty, claims 2, 3, 5 and 11-13 are not inventive in view of D3.

Notwithstanding the lack of novelty, claims 4, 6-8, 14 and 15 are also not inventive. Claims 4 and 14 are directed at sending a message to a washroom attendant after the automated resolution state. Claims 6-8 and 15 are directed at flushing the toilet multiple times as means of automated resolution. These are features that the skilled person would have been aware of (see D1: Paragraphs [0014]-[0016]; D2: Page 10 first paragraph, page 13 last paragraph - page 14 third paragraph – *manager informed of clog, control unit can change toilet to “blocking” mode to limit use of toilet when toilet is clogged, water may be continuously supplied*; D4: Paragraphs [0010]-[0012], [0016]-[0017] – *when toilet is clogged, waste is processed according to type and the toilet is flushed continuously, self-maintenance can be carried repeatedly to clear the toilet. If clog cannot be cleared, system can send out a fault signal to prompt a maintenance personnel to carry out repair*). Therefore, an inventive step cannot be acknowledged for claims 4, 6-8, 14 and 15 in view of D3 read alone.

Claims 9 and 16

Claim 9 is directed at the system of claim 7 further comprising the toilet not flushing when in the disabled state, which is an obvious implementation detail for the skilled person (see D3: Paragraph [0011] – *data collected from sensors, when component is deemed to be not working, the smart controller stops the component from working*). Therefore, claim 9 is not inventive in view of D1, D2 or D3 read separately.

Claim 16 is further directed at the event being assisted resolution type when the toilet is fully clogged, which is an intuitive measure that the skilled person would clearly execute. Therefore, claim 16 is not inventive in view of D1, D2 or D3 read separately.

Claim 18

Claim 18 is further directed at the system of claim 17 further comprising the first washroom component being a bath tissue or paper towel dispenser and the second washroom component being a toilet or urinal, which are common washroom components. Therefore, an inventive step cannot be acknowledged for claim 18 in view of D1.

3. Industrial applicability

Claims 1-18 are industrially applicable and therefore comply with PCT Article 33(4).

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US2019/034798

Box No. VI Certain documents cited

1. Certain published documents (Rules 43*bis*.1 and 70.10)

Application No. Patent No.	Publication date (day/month/year)	Filing date (day/month/year)	Priority date (valid claim) (day/month/year)
WO 2019/104354 A1	31/05/2019	27/11/2018	27/11/2017

Paragraphs [0063]-[0065] discloses a system that fills, cleans and maintains the water quality in a plurality of basins with soap dispensers using sensors. The sensors and valves can be automatically controlled (**Paragraphs [0066], [0070], [0076]**). The system can also be put into different operation modes (**Paragraph [0072]**). Cleanliness sensors enable the detection of the cleanliness of the liquid in the basin, which will allow the system to automatically drain and refill the basin if thresholds are crossed (**Paragraphs [0077], [0080]-[0081], [0085]**). A user can also be alerted to replace or refill a soap reservoir when the level of soap reaches a near empty condition (**Paragraph [0085]**).

2. Non-written disclosures (Rules 43*bis*.1 and 70.9)

Kind of non-written disclosure	Date of non-written disclosure (day/month/year)	Date of written disclosure referring to non-written disclosure (day/month/year)

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US2019/034798

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

1. Clarity and conciseness

Claim 1 does not comply with PCT Article 6.

Claim 1 is not clear. Line 10 of claim 1 refers to “the operability data”, which has not been previously defined. For purposes of establishing this opinion, it has been assumed to refer to “the operability level data”.