

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 65064641PCT02	FOR FURTHER ACTION		See Form PCT/IPEA/416
International application No. PCT/US2019/039164	International filing date (day/month/year) 26 June 2019 (26.06.2019)	Priority date (day/month/year) 29 June 2018 (29.06.2018)	
International Patent Classification (IPC) or both national classification and IPC IPC: G05B 11/00 CPC: Y02B 20/44, 20/40			
Applicant KIMBERLY-CLARK WORLDWIDE, INC.			

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 3 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
- a. ☒ (sent to the applicant and to the International Bureau) a total of 4 sheets, as follows:
- ☒ sheets of the description, claims and/or drawings which have been amended and/or sheets containing rectifications authorized by this Authority, unless those sheets were superseded or cancelled, and any accompanying letters (see Rules 46.5, 66.8, 70.16, 91.2, and Section 607 of the Administrative Instructions).
 - ☐ sheets containing rectifications, where the decision was made by this Authority not to take them into account because they were not authorized by or notified to this Authority at the time when this Authority began to draw up this report, and any accompanying letters (Rules 66.4bis, 70.2(e), 70.16 and 91.2).
 - ☐ superseded sheets and any accompanying letters, where this Authority either considers that the superseding sheets contain an amendment that goes beyond the disclosure in the international application as filed, or the superseding sheets were not accompanied by a letter indicating the basis for the amendments in the application as filed, as indicated in item 4 of Box No. I and the Supplemental Box (see Rule 70.16(b)).
- b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____ containing a sequence listing, in the form of an Annex C/ST.25 text file, as indicated in the Supplemental Box Relating to Sequence Listing (see paragraph 3ter of Annex C of the Administrative Instructions).

4. This report contains indications relating to the following items:
- ☒ Box No. I Basis of the report
 - ☐ 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 Article 35(2) 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

Date of submission of the demand 29 April 2020 (29.04.2020)	Date of completion of this report 25 June 2020 (25.06.2020)
Name and mailing address of the IPEA/US COMMISSIONER FOR PATENTS MAIL STOP PCT, ATTN: IPEA/US P.O. BOX 1450 ALEXANDRIA, VA 22313-1450, UNITED STATES OF AMERICA	Authorized officer BENYAM HAILE
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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/US2019/039164

Box No. I Basis of the report

1. With regard to the **language**, this report is based on:

- ☒ 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 purposes of:
- ☐ international search (Rules 12.3(a) and 23.1(b))
- ☐ publication of the international application (Rule 12.4(a))
- ☐ international preliminary examination (Rules 55.2(a) and/or 55.3(a) and (b))

2. With regard to the **elements** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

- ☐ the international application as originally filed/furnished, or
- ☒ the description:
pages 1-14 as originally filed/furnished.
pages* _____ received by this Authority on _____
pages* _____ received by this Authority on _____
- ☒ the claims:
Nos. _____ as originally filed/furnished.
Nos.* _____ as amended (together with any statement) under Article 19
Nos.* 1-13 received by this Authority on 29 April 2020 (29.04.2020)
- ☒ the drawings:
pages 1/3-3/3 as originally filed/furnished.
pages* _____ received by this Authority on _____
pages* _____ received by this Authority on _____
- ☐ a sequence listing - see Supplemental Box Relating to Sequence Listing.

3. ☒ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☒ the claims, Nos. 14-17
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since either they are considered to go beyond the disclosure as filed, or they were not accompanied by a letter indicating the basis for the amendments in the application as filed, as indicated in the Supplemental Box (Rules 70.2(c) and (c-bis)):

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____

5. ☐ This report has been established:

- ☐ taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rules 66.1(d-bis) and 70.2(e)).
- ☐ without taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rules 66.4bis and 70.2(e)).

6. With regard to top-up searches (Rules 66.1ter and 70.2(f)):

- ☒ A top-up search was carried out by this Authority on 25 June 2020 (25.06.2020)
- ☒ Additional relevant documents have been discovered during the top-up search.
- ☐ No top-up search was carried out by this Authority because it would serve no useful purpose.

7. ☐ Supplementary international search report(s) from Authority(ies) _____ has/
have been received and taken into account in establishing this report (Rule 45bis.8(b) and (c)).

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/US2019/039164

Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement		
1. Statement			
Novelty (N)	Claims	1-13	YES
	Claims		NO
Inventive step (IS)	Claims	1-13	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-13	YES
	Claims		NO
2. Citations and explanations (Rule 70.7)			
----- NEW CITATIONS -----			
US 20150022025 22 January 2015 (22.01.2015)			
US 20150207275 23 July 2015 (23.07.2015)			
US 20090119142 07 May 2009 (07.05.2009)			
----- EXPLANATION -----			
Claims 1-13 meets the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest a washroom determination system that uses a thermal sensor to detect the presence of a person based on a thermal event within a predetermined period of time inside the washroom and instruct a hygiene dispensers to enter a power saving mode based on the determination. Claims 1-13 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.			

WHAT IS CLAIMED IS:

1. A system for use in a washroom, wherein the washroom has an entrance, the system comprising:
a washroom controller configured to communicate with one or more hygiene dispensers in the washroom;
a thermal sensor, separate from the one or more hygiene dispensers, configured to detect thermal events at the entrance and communicate data describing the thermal events to the washroom controller;
and
a data processing apparatus configured to access the data from the washroom controller and analyze the data to determine a number of thermal events over a given time period and a number of dispenses from the at least one of the one or more hygiene dispensers,
wherein the data processing apparatus is further configured to (i), in response to determining that there have been no thermal events for a set period of time, instructing the one or more hygiene dispensers to enter a low energy state in which one or more hygiene dispensers cannot dispense, and (ii), in response to determining that there have been thermal events, instructing the one or more hygiene dispensers to enter an active state in which the one or more hygiene dispensers dispense in normal operation and can actuate to dispense products in response to an environmental stimulus.
2. The system of claim 1, wherein the data processing apparatus and washroom controller are part of a same device.
3. The system of claim 1, wherein the thermal sensor comprises an array of infrared sensors.
4. The system of claim 1, wherein determine a number of thermal events over a given time period comprises comparing the data to a thermal threshold level to identify the number of thermal events that exceed the thermal threshold level.
5. The system of claim 1, wherein determine a number of thermal events comprises interpolating the thermal data to generate interpolated thermal data.
6. The system of claim 5, wherein determine a number of thermal events comprises removing noise from the interpolated thermal data.

7. The system of claim 6, wherein removing noise from the interpolated thermal data comprises determining an average background temperature.
8. The system of claim 1, wherein the thermal sensor is configured to detect thermal hot zones in the washroom and a thermal hot zone is an area in the washroom that has a temperature higher than surrounding areas in the washroom.
9. The system of claim 8, wherein the data processing apparatus is configured to analyze the data to determine a number of thermal hot zones.
10. The system of claim 8, wherein the data processing apparatus is configured to analyze the data to determine a time duration that one of the thermal hot zones has not moved and in response to determining the time duration exceeds a threshold, the data processing apparatus is configured to notify an administrator.
11. The system of claim 1, wherein the entrance is a door.
12. The system of claim 1, wherein the entrance is an open threshold.
13. A method comprising:
 - communicating, from a hygiene dispenser in a washroom to a washroom controller, use data describing dispense events from the hygiene dispenser, wherein a dispense event defines an actuation of the dispenser to dispense consumable product;
 - detecting, by a thermal sensor, thermal events proximate an entrance of the washroom;
 - communicating, from the thermal sensor to the washroom controller, thermal data describing the thermal events;
 - analyzing the use data and thermal event data to determine a number of dispense events and a number of occupants that entered in the washroom; and
 - comparing the number of dispense events to the number of occupants; and

in response to determining that the number of occupants differs from the number of dispense events by a predetermined measure, providing a communication specifying that the hygiene dispenser may be malfunctioning.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: KIMBERLY-CLARK WORLDWIDE, INC.
Int'l. Appln. No.: PCT/US2019/039164
Int'l. Filing Date: 26 Jun 2019
Title: WASHROOM USE DETERMINATION SYSTEM
Docket No.: 65064641PCT02
Date: April 29, 2020

RESPONSE TO WRITTEN OPINION AND AMENDMENT UNDER PCT ARTICLE 34

Mail Stop PCT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir/Madam:

In response to the International Search Report and Written Opinion prepared by the International Searching Authority dated October 15, 2019, Applicant respectfully requests that the following remarks be considered in the above-referenced application pursuant to PCT Article 34.

Claim Amendments:

Claims 1, 8, and 10 have been amended. Claims 14-17 are cancelled without prejudice or disclaimer to the subject matter therein. Support for the amendments can be found, for example, at page 8, line 23 – page 9, line 5 and page 8, lines 2-7. No new matter is added.

Statement:

Claim 1

Claim 1 as amended herein includes features based on those of claim 11 (now cancelled). Specifically, claim 1 now recites “the data processing apparatus is further configured to (i), in response to determining that there have been no thermal events for a set period of time, instructing the one or more hygiene dispensers to enter a low energy state in which one or more hygiene dispensers cannot dispense, and (ii), in response to determining that there have been thermal events, instructing the one or

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more hygiene dispensers to enter an active state in which the one or more hygiene dispensers dispense in normal operation and can actuate to dispense products in response to an environmental stimulus.” This functionality is described, for example, at page 8, line 23 – page 9, line 5 of the specification.

To support the rejection of claim 11, the Written Opinion relies on, in part, paragraph 129 of D1, which describes “ [i]n other words, data can be collected with respect to already-existing sensors 112 that are conventionally utilized to sense the presence of a target user and for example, turn an associated fixture 130, such as the faucet 136, on or off.” This is describing, for example, a hand wave sensor that is used to actuate the faucet on or off, i.e., to dispense water or not, where such a sensor is typically part of the faucet.

In contract claim 1 recites “a thermal sensor, separate from the one or more hygiene dispensers, configured to detect thermal events at the entrance” of the washroom” where the data processing apparatus causes the dispenser(s) to switch between low and active energy states in response to determining whether there have been thermal events detected by the thermal sensor. Claim 1 also recites that once a dispenser is in the active state it can then dispense if triggered to dispense by an environment stimulus. Thus the active energy state is not the same as actuating the dispenser to dispense product. Rather the active energy state is the state in which the dispenser is capable of dispensing product if triggered to dispense by an environment stimulus. The relied upon portions of D1 do not discuss this low/active energy state construct as claimed in claim 1.

Claim 10

Claim 10 now recites that “the data processing apparatus is configured to analyze the data to determine a time duration that of one of the thermal hot zones has not moved and in response to determining the time duration exceeds a threshold” notifying an administrator. At page 8, lines 2-7, the specification describes that “[i]f the data processing apparatus 110 determines that the cluster stays in the same place for an administratively set time period (e.g., twenty minutes) and optionally during a specified time of day (e.g., from 9pm to 4am), the data processing apparatus 110 can send an message to a device of a system administrator, as the cluster (representing an

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occupant) not moving for the specified duration could be an indication that an occupant is in distress.” This is not disclosed in the relied upon portions of D1.

Claim 18

Claim 18 recites “in response to determining that the number of occupants differs from the number of dispense events by a predetermined measure, providing a communication specifying that the hygiene dispenser may be malfunctioning.”

With regard to claim 18, the Written Opinion acknowledges that D1 does not disclose this feature. Nonetheless, the Written Opinion goes on to assert “[t]he sensor data including the usage of the dispenser and the number of patron visitor is available for analysis and correlation at the restroom convenience centre controller, it would be obvious to the skilled person to specify an alarm for each dispenser to perform maintenances or take actions in order in effectuating timely services to the restroom. Hence, claim 18 lacks an inventive step in view of D1.”

However, this is merely a conclusory statement without any support in the cited reference. The mere fact that D1 may disclose patron information and dispense information, as asserted in the Written Opinion, cannot properly be used to support a position that all uses of that information are not inventive. There is simply no support in the relied upon portions of the cited reference to compare the number of occupants and the number of dispense events and infer a difference means that the hygiene dispenser may be malfunctioning.

Conclusion:

Applicant respectfully submits that all of the claims of the present application satisfy the requirements of novelty, inventive step, and industrial applicability. In light of the

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foregoing, issuance of a favorable International Preliminary Report on Patentability is respectfully requested.

Respectfully submitted,

KIMBERLY-CLARK WORLDWIDE, INC.

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