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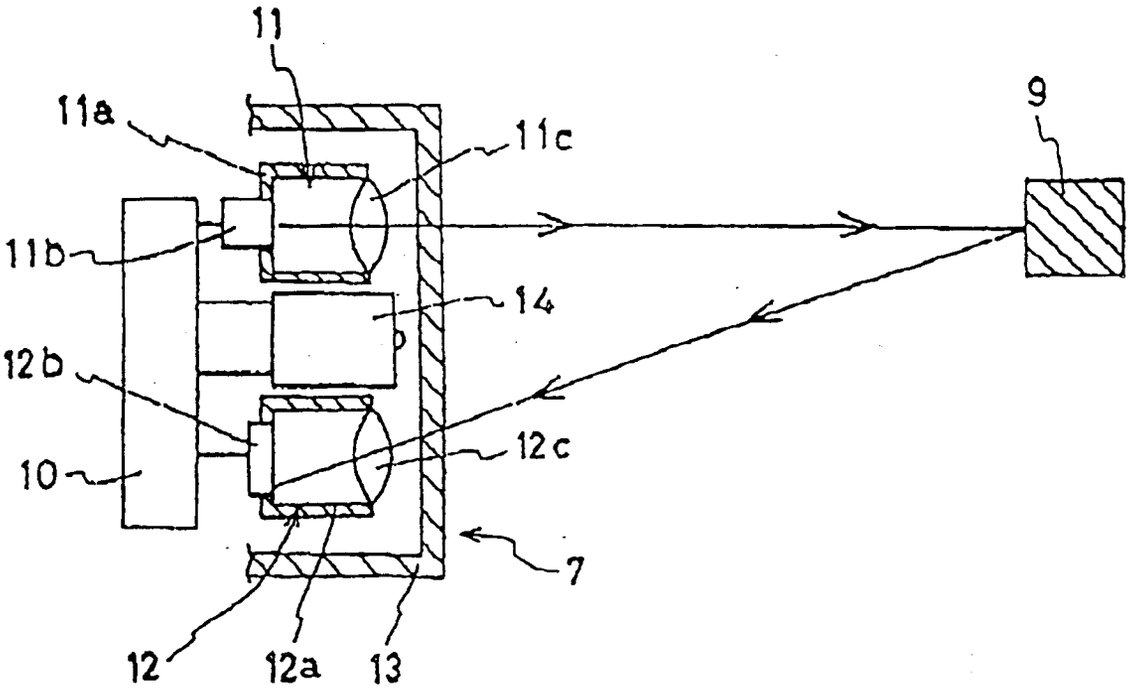
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(54) **Hygienic apparatus for bathroom.**

(57) Disclosed is a hygienic apparatus for a bathroom, which is comprised of human body detecting device (7) including light emitting device (11) adapted to emit an optical signal toward a human body, and first light receiving device (12) adapted to receive the optical signal reflected from the human body, thereby detecting where a human body is, second light receiving device (14) adapted to receive other optical signals emitted by a remote controller (8) disposed on a wall of a bathroom, and a body (2) including a window (W), the window adapted to incorporate the human body detecting device and the second light receiving device therein. In the hygienic apparatus, the window is shared by the human body detecting device and the second light receiving device. Hence, the assembly operation of the hygienic apparatus can be simplified as a whole, thereby enabling to reduce the manufacturing cost. In addition, the hygienic apparatus can be improved in the appearance as well.

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Fig. 2



BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to a hygienic apparatus for a bathroom or a sanitary room, and it particularly relates to such a hygienic apparatus provided with human body detecting means.

Description of the Related Art

There have been a lot of the hygienic apparatuses of the aforementioned type. One of them is "CW-630" made by INAX Co., Ltd., and it is provided with human body detecting means.

In the conventional "CW-630" hygienic apparatus, the human body detecting means is disposed at an end of a casing, and it is comprised of light emitting means adapted to emit an optical signal toward a human body, and light receiving means adapted to receive the optical signal reflected from the human body, thereby detecting where the human body is. Further, independently of the human body detecting means, remote controller light receiving means is disposed in the casing, and it is positioned adjacent to the position where the human body detecting means is disposed. The remote controller light receiving means is adapted to receive other optical signals emitted by a remote controller disposed on a wall of a bathroom, thereby actuating the "CW-630" hygienic apparatus.

However, in the conventional "CW-630" hygienic apparatus, the human body detecting means and the remote controller light receiving means are disposed at different positions independently. Consequently, it is needed to provide the casing with two windows at the end, windows which are adapted to pass the optical signal reflected from the human body and the other optical signals emitted by the remote controller, respectively. Such a construction adversely affects the operability in the assembling operation, and it eventually results in an increasing manufacturing cost.

In addition, in the conventional "CW-630" hygienic apparatus, there is a dead space between the light emitting means and the light receiving means of the human body detecting means because the human body detecting means is adapted to detect where the human body is by the triangulation.

SUMMARY OF THE INVENTION

It is therefore an object of the present invention to solve the problems associated with the conventional hygienic apparatuses for a bathroom.

A hygienic apparatus for a bathroom according to the present invention can carry out the aforementioned object, and it comprises:

human body detecting means including light emitting means adapted to emit an optical signal toward a human body, and first light receiving means adapted to receive the optical signal reflected from the human body, thereby detecting where a human body is;

second light receiving means adapted to receive other optical signals emitted by a remote controller disposed on a wall of a bathroom; and

a body including a window, the window adapted to incorporate the human body detecting means and the second light receiving means therein.

In the present hygienic apparatus, the human body detecting means and the second light receiving means are disposed in the single window formed in the body. In other words, in the present hygienic apparatus, the window is shared by the human body detecting means and the second light receiving means.

Thus, in accordance with the present hygienic apparatus, the single window can be shared by the human body detecting means and the second light receiving means, and accordingly it can be adapted to pass the optical signal reflected from the human body as well as the other optical signals emitted by the remote controller disposed independently of the present hygienic apparatus in a bathroom. With the construction, the assembly operation of the present hygienic apparatus can be simplified as a whole, and thereby the manufacturing cost can be reduced.

Further, the body of the present hygienic apparatus can further include a casing which is disposed on the top rear side thereof, which is adapted to hold a lid and a seat rotatably, and which has the window.

Furthermore, in the present hygienic apparatus, the second light receiving means can be preferably disposed between the light emitting means and the first light receiving means of the human body detecting means.

Moreover, in the present hygienic apparatus, the human body detecting means can be preferably adapted to detect whether the human body is in front of the body or not.

In addition, in the present hygienic apparatus, the human body detecting means can be preferably adapted to detect whether the human body is on the body or not.

BRIEF DESCRIPTION OF THE DRAWINGS

A more complete appreciation of the present invention and many of its advantages will be readily obtained as the same becomes better understood by reference to the following detailed description when considered in connection with the

accompanying drawings and detailed specification, all of which forms a part of the disclosure:

Figure 1 is a perspective view of a preferred embodiment of a hygienic apparatus for a bathroom according to the present invention; and

Figure 2 is a cross-sectional view of a part of the preferred embodiment of the present hygienic apparatus.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Having generally described the present invention, a further understanding can be obtained by reference to the specific preferred embodiment which is provided herein for purposes of illustration only and is not intended to limit the scope of the appended claims.

The preferred embodiment of the present hygienic apparatus for a bathroom or a sanitary room will be hereinafter described with reference to Figures 1 and 2. Figure 1 illustrates the present hygienic apparatus in a perspective view, and Figure 2 illustrates human body detecting means and second light receiving means of the present hygienic apparatus in a cross-sectional view.

As illustrated in Figure 1, the present hygienic apparatus 1 comprises a body or a toilet bowl 2 provided with a casing 3. Further, the casing 3 is disposed on the top rear side of the toilet bowl 2, and it is adapted to rotatably hold a seat 4 and a lid 5 at their ends. Furthermore, in the rear inner wall of the toilet bowl 2, there is held a nozzle 6 movably back and forth. The nozzle 6 is adapted to spout lukewarm water having an adequate temperature in a sufficient amount upward in Figure 1, thereby carrying out the anus washing or the female pubic portion washing. Further, the nozzle 6 is adapted to blow lukewarm air having an adequate temperature in a sufficient amount upward in Figure 1, thereby drying the human private parts after the respective washing operations.

As can be seen from Figure 1, there is detachably mounted a remote controller 8 on a bathroom wall. The remote controller 8 is provided with switches (not shown) disposed therein, and it is further provided with remote controller light emitting means 8a on the bottom in the drawing. When a user depresses one of the switches, the remote controller light emitting means 8a emits an optical signal or beam, e.g., an infrared radiation in general, which is allotted to one of the switches.

As can be appreciated from Figure 1, there is formed a single window "W" in the casing 3 on the top left side in the drawing. In the widow "W," there are disposed human body detecting means 7 and remote controller light receiving means 14 (i.e., the second light receiving means) as hereinafter described. The human body detecting means 7 can be a human body detecting sensor which is adapted to detect whether the human body is in front of the toilet bowl 2 or not, or it can be a seated state detecting sensor which is adapted to detect whether the human body is on the seat 3 of the toilet bowl 2 or not.

The constructions of the human body detecting means 7 and the remote controller light receiving means 14 will be hereinafter described in detail with reference to Figure 2. As illustrated in Figure 2, the human body detecting means 7 includes a container 13. A substrate 10 is disposed in the container 13, and light emitting means 11 and light receiving means 12 are disposed on the top side and the bottom side of the substrate 10, respectively, in the drawing. The light emitting means 11 and the light receiving means 12 constitute the human body detecting means 7, and they can include a photoelectric transducer, which converts light into electricity, or vice versa, such as a photodiode, a phototransistor, a light emitting diode, or the like. For instance, the light emitting means 11 can include a light emitting diode, and the light receiving means 12 can include a photodiode.

The light emitting means 11 includes a tubular body 11a, a light emitting device 11b, and a light emitting lens 11c. The tubular body 11a is fixed above the top side of the substrate 10 in Figure 2, and it has an opening at the right end in the drawing. The light emitting device 11b is disposed so as to penetrate through the bottom of the tubular body 11a at the left end in the drawing, and it is fixed on the top side of the substrate 10 in the drawing. The light emitting lens 11c is disposed adjacent to the opening of the tubular body 11a so as to close the opening of the tubular body 11a.

The light receiving means 12 includes a tubular body 12a, a light receiving device 12b, and a light receiving lens 12c. The tubular body 12a is fixed above the bottom side of the substrate 10 in Figure 2, and it has an opening at the right end in the drawing. The light receiving device 12b is disposed so as to penetrate through the bottom of the tubular body 12a at the left end in the drawing, and it is fixed on the bottom side of the substrate 10 in the drawing. The light receiving lens 12c is disposed adjacent to the opening of the tubular body 12a so as to close the opening of the tubular body 12a.

Thus, the light emitting device 11b of the light emitting means 11 emits an optical signal or beam toward a human body 9 by way of the light emitting lens 11c. The optical signal is reflected from the human body 9. Then, the reflected optical signal is received by the light receiving device 12b by way of the light receiving lens 12c, thereby detecting where the human body 9 is. Hence, in

the present hygienic apparatus, the human body detecting means 7 carries out the detection of the human body 9 by the triangulation.

Moreover, as illustrated in Figure 2, remote controller light receiving means 14 is disposed fixedly on the intermediate side of the substrate 10 so as to interpose between the light emitting means 11 and the light receiving means 12 of the human body detecting means 7. It is adapted to receive the optical signals, other than the optical signal emitted by the light emitting means 11, emitted by the remote controller light emitting means 8a of the remote controller 8 illustrated in Figure 1. The remote controller light receiving means 14 can include a photoelectric transducer, which converts light into electricity, or vice versa, such as a photodiode, a phototransistor, or the like. In the present hygienic apparatus 1, the remote controller light receiving means 14 is disposed between the light emitting means 11 and the light receiving means 12 in order to effectively utilize the dead space between the light emitting means and the light receiving means of the conventional hygienic apparatus.

The operation of the present hygienic apparatus 1 will be hereinafter described. For instance, when a user depresses one of the switches of the remote controller 8 in order to carry out the anus washing, an anus washing optical signal is emitted by the remote controller light emitting means 8a toward the remote controller light receiving means 14 which is incorporated into the human body detecting means 7. Then, controlling means (not shown, but disposed in the casing 3) instructs the nozzle 6 to carry out the anus washing in accordance with the optical signal received by way of the remote controller light receiving means 14. Eventually, the nozzle 6 advances forward, and it washes the anus of the user.

In the present hygienic apparatus 1, not only the light emitting means 11 and the light receiving means 12 of the human body detecting means 7 but also the remote controller light receiving means 14 are disposed in the single window "W" which is formed in the casing 3. To put it differently, in the present hygienic apparatus 1, the window "W" is shared by the human body detecting means 7 and the remote controller light receiving means 14. With the construction, the assembly operation of the present hygienic apparatus 1 can be simplified as a whole, and thereby the manufacturing cost can be reduced. In addition, the present hygienic apparatus 1 can be improved in the appearance as well.

Moreover, the conventional human body detecting means of the conventional hygienic apparatuses is provided with the dead space between the light emitting means and the light receiving means because it is similarly adapted to detect where the human body is by the triangulation. On the other hand, in the present hygienic apparatus 1, although the remote controller light receiving means 14 is disposed between the light emitting means 11 and the light receiving means 12 of the human body detecting means 7 to eliminate the dead space, the detection of the human body 9 can be carried out accurately without interference because the light emitting means 11 is adapted to emit the optical signal having high directivity and the light receiving means 12 is adapted to receive the reflected optical signal with high sensitivity. Consequently, the present hygienic apparatus 1 can utilize the dead space effectively. As a result, in accordance with the present hygienic apparatus 1, it is unnecessary to provide the casing 3 with a space for the remote controller light receiving means 14 independently of the human body detecting means 7. All in all, the present hygienic apparatus 1 is down-sized, thereby resulting in a further manufacturing cost reduction.

Having now fully described the present invention, it will be apparent to one of ordinary skill in the art that many changes and modifications can be made thereto without departing from the spirit or scope of the present invention as set forth herein including the appended claims.

Disclosed is a hygienic apparatus for a bathroom, which is comprised of human body detecting device including light emitting device adapted to emit an optical signal toward a human body, and first light receiving device adapted to receive the optical signal reflected from the human body, thereby detecting where a human body is, second light receiving device adapted to receive other optical signals emitted by a remote controller disposed on a wall of a bathroom, and a body including a window, the window adapted to incorporate the human body detecting device and the second light receiving device therein. In the hygienic apparatus, the window is shared by the human body detecting device and the second light receiving device. Hence, the assembly operation of the hygienic apparatus can be simplified as a whole, thereby enabling to reduce the manufacturing cost. In addition, the hygienic apparatus can be improved in the appearance as well.

Claims

1. A hygienic apparatus for a bathroom, comprising:

human body detecting means including light emitting means adapted to emit an optical signal toward a human body, and first light receiving means adapted to receive the optical signal reflected from the human body, thereby

detecting where a human body is;

second light receiving means adapted to receive other optical signals emitted by a remote controller disposed on a wall of a bathroom; and

a body;

said hygienic apparatus characterized in that said body includes a window adapted to incorporate said human body detecting means and said second light receiving means therein.

2. The hygienic apparatus according to claim 1 further characterized in that said body further includes a casing, the casing disposed on the top rear side thereof, adapted to hold a lid and a seat rotatably, and having said window.

3. The hygienic apparatus according to claim 1 further characterized in that said second light receiving means is disposed between said light emitting means and said first light receiving means of said human body detecting means.

4. The hygienic apparatus according to claim 1 further characterized in that said human body detecting means is adapted to detect whether said human body is in front of said body or not.

5. The hygienic apparatus according to claim 1 further characterized in that said human body detecting means is adapted to detect whether said human body is on said body or not.

6. A hygienic apparatus for a bathroom, comprising:

human body detecting means including light emitting means adapted to emit an optical signal toward a human body, and light receiving means adapted to receive the optical signal reflected from the human body, thereby detecting where a human body is;

remote controller disposed on a wall of bathroom, and adapted to emit other optical signals;

remote controller light receiving means adapted to receive said other optical signals emitted by said remote controller; and

a body;

said hygienic apparatus characterized in that said body includes a window adapted to incorporate said human body detecting means and said remote controller light receiving means therein.

Fig. 1

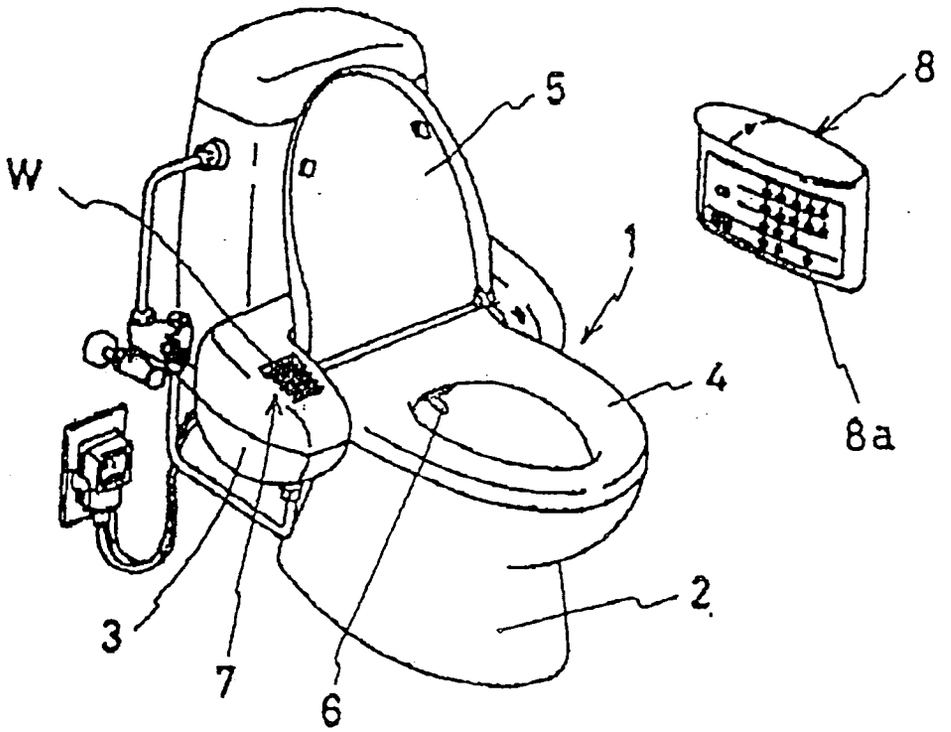
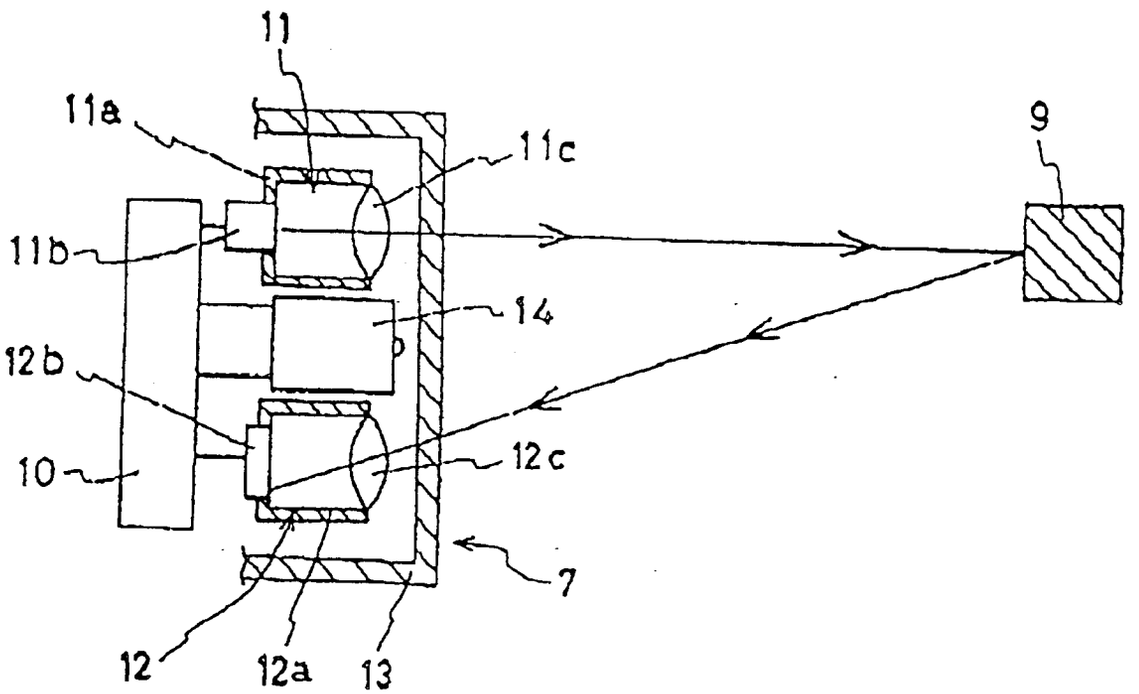


Fig. 2



European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 93 11 4664

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
X	EP-A-0 487 977 (INAX CORPORATION) * column 2, line 13 - column 3, line 9 * * column 3, line 30 - line 55; figures *	1-6	E03D5/10 E03D9/08
A	US-A-4 805 247 (LAVERTY) * the whole document *	1,4,6	

TECHNICAL FIELDS SEARCHED (Int.Cl.5)

E03D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	22 November 1993	DE COENE, P

CATEGORY OF CITED DOCUMENTS

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