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**(54) AUTOMATIC WINDOW PROVIDED WITH SOUND RECOGNITION DEVICE FOR PREVENTING OF NOISE**

(57) An automatic window provided with a sound recognition device for the prevention of noise, which comprises a noise inputting unit (5), a sound recognition device (1), a central control unit (4), a window opening and closing device (2) and a window (3). Analysis is effected by the sound recognition device (1), in which sounds to be removed have been registered, whereby the central control unit (4) closes the window (3) to effectively remove noises which have been registered in the sound recognition device (1).

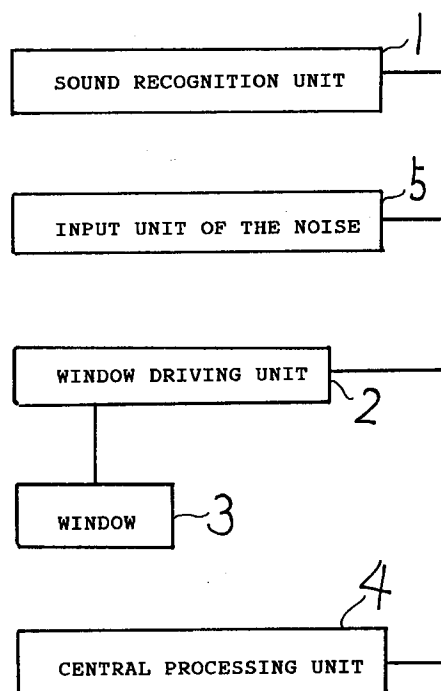


Fig. 1

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## Description

### Technical field

Present invention is about the opening or shutting control unit for the automatic window or automatic door.

### Background Art

Japanese unexamined patent application no. P-A47-82267, i.e. Tokukai-Shou 47-82267, was disclosed in Japan.

It is about an automatic window for prevention of noise.

The purpose of this former invention is an automatic opening and shutting of the window, detecting the noise of the airplane.

Japanese unexamined patent application no. JP-A3-81487, i.e. Tokukai-Hei 3-81487, was disclosed in Japan.

It is about an opening and closing unit which uses a sound sensor and sound detecting circuit.

The purpose of this former invention is closing the window, detecting the sound of hail, and noting when it is hail.

In the first former technology, the following judgement is lacking.

The judgement that the sound from the outside is the sound of an airplane, or not in this way, the automatic window may close, detecting the sound from a car for example which runs nearby.

The automatic windows used in the school may close, detecting the voice of the students who are playing sport in the ground, or, detecting the sound of a broadcast in the school ground.

In the second technology, the following judgement lacks.

The judgement that the detected sound is a sound of hail or not.

Due to these defects misoperation may arise. That is to say, the machine may be activated by a sound other than hail.

Present invention tries to solve the above problem using the recent technology of speech recognition.

"Microsoft Windows Sound System" is an example of sound recognition technology.

### Disclosure of Invention

Present invention is an automatic window provided with a sound recognition unit for prevention of noise, which comprises an input unit 5 of noise from an outside, a sound recognition unit 1 that analyzes whether the sound is a registered noise or not, a window 3, a window driving unit 2 and a central processing unit 4 that gives the window driving unit 2 an instruction "Open the window" or "Close the window" according to a signal of the sound recognition unit 1.

When an external noise enters the input unit 5 of the noise, the central processing unit 4 judges whether the input noise is a registered noise (for example, a noise of an airplane) or not, using an analysis of the sound recognition unit 1. If the noise is a registered one, the central processing unit 4 gives the window driving unit 2 the signal of "Close the window" and the window 3 closes. While the noise of the airplane is over pre-set sound volume window 3 is closed. If its noise decreases in volume the central processing unit 4 gives the window driving unit 2 the signal to "Open the window" and window 3 opens.

When voices of pupils enter the input unit 5 of the noise, the central processing unit 4 judges that it is not a registered noise, using the analysis of the sound recognition unit 1 that compares input noise with registered noise. Window 3 stays open.

### Brief description of the drawings.

Fig.1 is a block chart of present invention. The explanation of the marks is as follows.

- 1:sound recognition unit.
- 2:window driving unit.
- 3>window.
- 4:central processing unit.
- 5:input unit of noise.

### Best Mode for Enforcement of Invention

The input unit 5 of noise comprises mike and so on.

The window driving unit 2 comprises a motor and so on. It is possible to apply present invention to schools, apartment, houses, and hospitals.

Present invention can cope with various noises which are registered in advance.

If the noise of an airplane is registered on the sound recognition unit 1, the windows or doors of a house near airport or under the route of airplanes close automatically.

If the noise of the super express "Hikari" or other trains are registered, the windows or doors of houses along the route of the trains are closed automatically. The unit will only detect the noise of the super express "Hikari" or other trains.

For areas that are near both the airport and the route of the super express "Hikari", if both the noises of the airplane and the super express "Hikari" are registered, present invention can cope with both noises.

Present invention can also be applied to the prevention of noise from factories. If noise from a factory is registered, present invention can cope with it. That is, the windows are closed automatically, when the noise of the factory arises. The window opens automatically, when the noise stops.

When the noise arises intermittently, the window will open or close automatically according to its noise.

If present invention is applied to the panels of the roof of a hothouse and the sound of hail is registered in the sound recognition unit 1, the plants in the hothouse can be protected by closing the panels of the roof of the hothouse automatically.

Due to the fact that both airplanes, the super express "HIKARI" run to a set time schedule, these times can be programmed into the central processing unit 4.

These time schedules are very time schedules of their noise.

For example, at the place where super express passes at 10:00 AM, the central processing unit 4 can close the window 3 between 9:55 AM and 10:05 AM.

In this way, even if the input unit 5 of noise or the sound recognition unit 1 becomes out of order, the windows will still be opened or closed automatically when present invention is used in a coffee house or a private house, on line connection of the central processing unit 4 can be made to an audio machine (for example, stereo) or a radio, a wire broadcasting unit in this way, it is possible to output background music or multiply the volume of the sound of the music and at the same time have the windows closed, when the external noise is detected.

When we apply present invention to a hospital, it is convenient for the patients who are disabled, as opening or closing windows is automatic.

When we apply present invention to a private house, it is convenient for elderly people for the same reason.

Present invention is convenient for the elderly.

If we register the noise of the super express "Hikari" when it rains, automatic opening and closing of the windows becomes accurate, when it rains. If we use rain sensor (not illustrated), the central processing unit judges that it is rain, using a signal of rain sensor and keeps the window closed, when it rains.

#### Industrial availability

We can effectively exclude registered noises, because the central processing unit 4 closes the window 3 using the analysis of the sound recognition unit 1 which registers sounds that we want to exclude.

Using this invention, we can open or close the window automatically, allowing, the air of the room to exchange, and preventing ticks and mold. We can reduce the allergies that creates allergic reactions to people.

The windows will remain open for sounds that are not registered on the sound recognition unit 1, in this way, hearing the voices of their children playing outdoors, parents inside can take care of their children.

If we set one sound recognition unit on flats or apartment house and its signal is delivered to each room, we can realize present system economically.

#### **Claims**

1. Automatic window for prevention of noise, which comprises an input unit 5 of noise from an outside, a sound recognition unit 1 that analyzes whether said noise is a registered noise or not, window 3, window driving unit 2 and a central processing unit 4 that gives said window driving unit 2 an instruction "Open window 3" or "Close window 3" according to a signal from said sound recognition unit 1.
2. Automatic window according to claim 1 wherein said central processing unit 4 memorizes a time schedule of said noise and gives said window driving unit 2 an instruction "Open window 3" or "Close window 3" according to said time schedule, when said input unit 5 of noise or said sound recognition unit 1 are out of order.

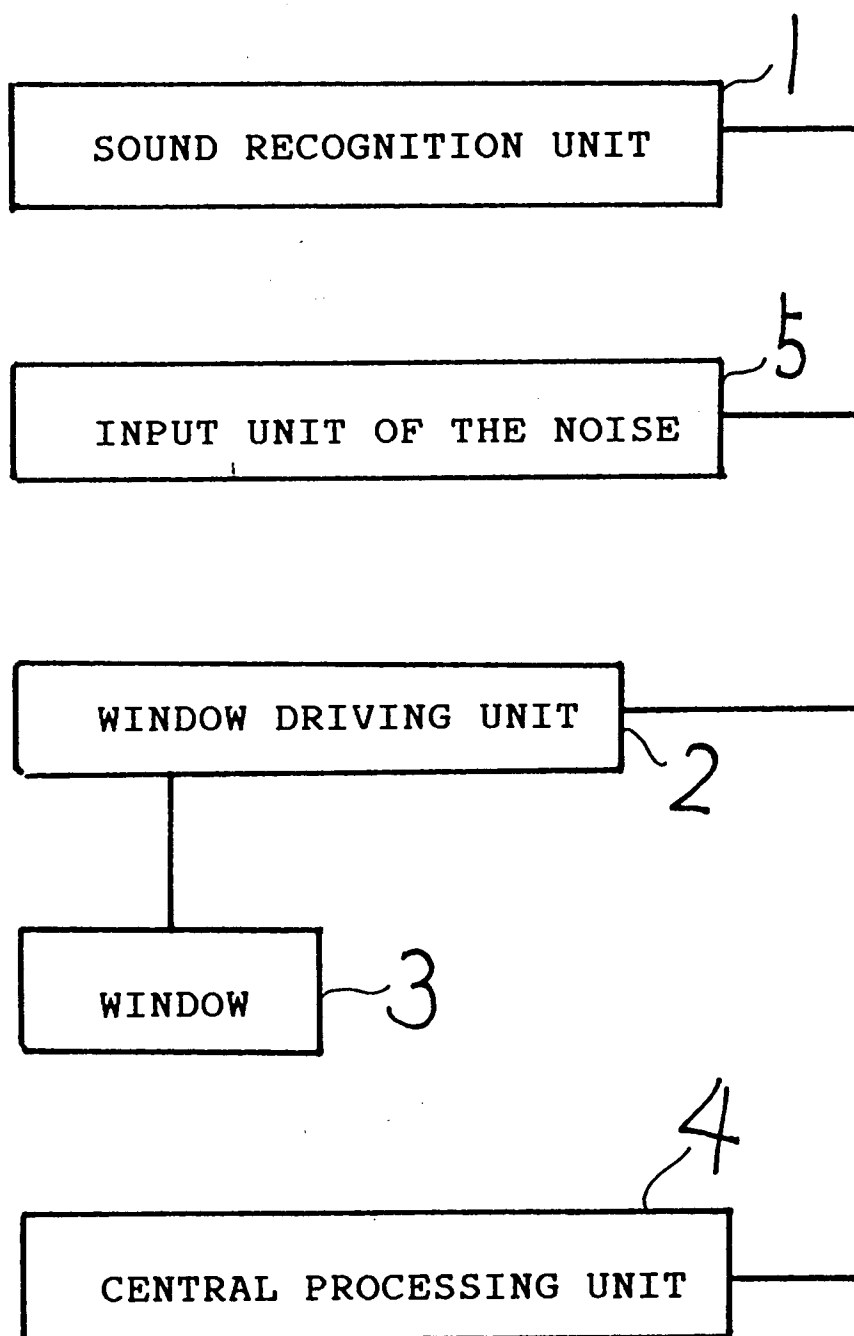


Fig. 1

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP94/01884

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> Int. Cl <sup>6</sup> E05F15/20 According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) Int. Cl <sup>6</sup> E05F15/00 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Jitsuyo Shinan Koho 1926 - 1993 Kokai Jitsuyo Shinan Koho 1971 - 1993 Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP, A, 51-25353 (Howa Kogyo K.K.),	1
Y	March 17, 1976 (01.03.76), Line 3, lower right column, page 3 to line 19, lower left column, page 3 (Family: none)	2
Y	Microfilm of the specification and drawings annexed to the written application of Japanese Utility Model Application No. 52725/1985 (Laid-open No. 168283/1986), (Retsuji Maeda) October 18, 1986 (18. 10. 86), lines 1 to 17, page 7, (Family: none)	2
A	JP, A, 49-38450 (Omron Corp.), April 10, 1974 (10. 04. 74), (Family: none)	1, 2
A	JP, U, 2-68082 (NEC Office System K.K.), May 23, 1990 (23. 05. 90) (Family: none)	2
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family 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 January 25, 1995 (25. 01. 95)		Date of mailing of the international search report February 21, 1995 (21. 02. 95)
Name and mailing address of the ISA/ Japanese Patent Office Facsimile No.		Authorized officer Telephone No.