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NL-1000 HB Amsterdam(NL)(54) **Revolving door, in particular for protecting the access to a room.**

(57) A revolving door, in particular for protecting the access to a room, comprises a revolving shaft (2), a plurality of door wings (3) attached to the shaft (2) and spaced around it, a pair of opposite panels (4) bordering the door wings (3) and forming a partially closed zone with a first (6) and a second opening (7), a drive motor (9) for the shaft (2) and a control unit (10) for the drive motor (9). A detecting means (13) is provided for detecting whether or not a person is authorized to access the room, and a first sensor (11) for detecting an unauthorized person entering the zone through the first (6) or second (7) opening, respectively, wherein the control unit (10) stops the drive motor (9) in response to the first sensor (11). Further a control means (18) is provided operable by an unauthorized person confined between two successive door wings in the sector of the partially closed zone as determined by the (each) panel. This control means (18) is only active if an unauthorized person is confined in said sector and in that case upon operation is adapted to cause the drive means to drive the shaft (2) in reverse to the passage direction.

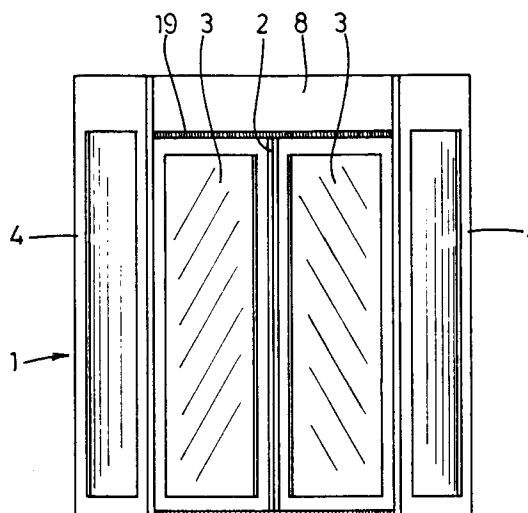


fig.1

EP 0 504 953 A1

The invention relates to a revolving door, in particular for protecting the access to a room, comprising a revolving shaft, a plurality of door wings attached to the shaft and spaced around it, a pair of opposite panels bordering the door wings and forming a partly closed zone with a first and second opening, a drive motor for the shaft and a control unit for the drive motor, wherein a detecting means is provided for detecting whether or not a person is authorized to access the room, and a first sensor for detecting an unauthorized person entering the zone through the first or second opening respectively, wherein the control unit stops the drive motor in response to the first sensor.

Such revolving doors are known in several embodiments. In the known revolving door the control unit for the drive motor is adapted to stop the drive motor only if the unauthorized person is confined between two door wings and an adjacent panel and to subsequently drive the shaft automatically in reverse direction of rotation, whereby a person intending to go unauthorized from the first to the second opening, is forced to return to the first opening. Although the known revolving door provides a good protection of the access to the room in this manner, the known revolving door has the disadvantage that by automatically rotating in reverse direction upon an attempt by an unauthorized person to access the protected room, there is a change to injure this person because the rotation in reverse takes place unexpectedly.

The invention aims to provide a revolving door of the above-mentioned type wherein this disadvantage is obviated and an effective protection of the access to the room is maintained.

To this end the revolving door according to the invention is characterized by a control means operable by an unauthorized person confined between two successive door wings in the sector of the partially closed zone as determined by the (each) panel, said control means being active only if an unauthorized person is confined in said sector and in that case upon operation is adapted to cause the drive motor to drive the shaft in reverse to the passage direction.

In this manner a revolving door is obtained wherein the chance to injure an unauthorized person who becomes confined in the sector of the partially closed zone as determined by the (each) panel of the revolving door, is fully eliminated because the rotation in reverse of the revolving door is started by the person involved himself.

Preferably the control unit stops the driving in reverse to the passage direction as soon as, seen in passage direction, the rear door wing confining the unauthorized person has at least substantially reached the middle of the adjacent opening, so that it is guaranteed that the person involved can leave

the partially closed zone of the revolving door.

According to a particularly favorable embodiment warning means are provided indicating to a confined unauthorized person the possibility to operate the control means. These warning means can for example generate an optical and an acoustical signal, wherein the optical signal can be provided by an indicator lamp or the like mounted in the control means. As acoustical warning signal it is for example possible to use a spoken message stored in a so-called voice module.

The invention will be further explained by reference to the drawings in which an embodiment of the revolving door according to the invention is schematically shown.

Fig. 1 is a front view of an embodiment of the revolving door according to the invention.

Fig. 2 is a schematically shown horizontal section of the revolving door of fig. 1.

Fig. 3 is a very simplified diagram of the electrical circuit of the revolving door of fig. 1.

Referring to figs. 1 and 2 there is shown a revolving door 1 for the protection the access to a room, which revolving door 1 comprises a revolving shaft 2 and four door wings 3 attached to the shaft 2 and evenly spaced around the shaft. Further the revolving door 1 comprises two opposite panels 4 bordering the door wings 3 and forming a partly closed, in this case circular zone 5 with a first opening 6 and a second opening 7. Above the door wings 3 there is a space covered by a cover 8 in which a drive motor 9 for the shaft 2 and the control unit 10 are accommodated in a usual manner. The control unit 10 and the drive motor 9 are shown in a very simplified diagram in fig. 3.

Within the partly closed zone 5 there are provided two contact mats 11, 12 which are made in a usual manner and which extend along a circle sector of approximately 110° in the embodiment shown, wherein a circle sector part of substantially 40° is located at the one side and a part of substantially 70° at the other side of a door wing 3 when the revolving door is stationary. These contact mats 11, 12 indicate the entering of the zone 5 to the control unit 10. The revolving door 1 further includes a card reader 13 only shown in the diagram of fig. 3 which reader is for example located in front of the first opening 6 which is then the entrance for the room to be protected at the other side of the revolving door 1. It is of course also possible to place a card reader 13 at the second opening 7 if leaving the room should also be protected. By inserting an admission pass a person who wants to enter the room can indicate that he is authorized to enter this room. As soon as this person enters subsequently the zone 5 and steps on the contact mat 11, the drive motor 9 is energized by the control unit 10 to rotate the shaft 2

along an angle of 180° so that the authorized person can leave the zone 5 through the second opening 7 at the side of the protected room.

In the revolving door 1 described an indicator lamp 14 is provided by means of which the control unit 10 can indicate to the person whether or not the admission pass has been accepted. If a card reader 13 is provided on both sides of the revolving door 1, an indicator lamp 14 is provided at both sides too. Apart from the contact mats 11, 12, detecting means 15, 16 are further provided in the revolving door 1 described for indicating the entrance of the zone 5 to the control unit 10. The revolving door 1 further comprises a plurality of switches 17 in the usual manner by means of which the position of the door wings 3 can be detected.

In order to provide an effective protection of the access to the room, the entrance of the zone 5 by an unauthorized person who attempts to enter the zone 5 for example during revolving of the door wings 3 to pass an authorized person, in order to reach the protected room in this manner, should be indicated to the control unit 10. To this end the contact mat 11 located at the side of the first opening 6 is used in the usual manner. If the contact mat 11 detects an unauthorized person, the drive motor 9 is immediately stopped so that this unauthorized person cannot reach the protected room. Practice has shown that there are persons with some skill who manage to confine themselves in the room between two subsequent door wings 3 and the adjacent panel 4. Although it would be possible to release the confined unauthorized person by automatically rotating in reverse the door wings 3, the automatic rotation in reverse of the door wings could lead to injury of the person involved as this person could be surprised by the unexpected rotation in reverse of the door wings.

In the described revolving door according to the invention the chance to injure the person involved is eliminated in that after stopping the drive motor the control unit activates a control means made as a push button 18 which can be operated by the unauthorized person who became confined between two subsequent door wings 3 and the adjacent panel 4. Preferably this push button 18 is mounted in the ceiling 19 of the revolving door bordering the upper side of the door wings 3. However, it is also possible to mount the push button 18 in the panel 4, for example.

Further warning means 20 are provided to indicate to the person involved that the push button 18 can be operated to rotate in reverse the door wings 3. These warning means 20 consist in the described embodiment of an indicator lamp mounted in the push button 18 and of an acoustical indicator means which can be realized if desired by

a spoken message stored in a so-called voice module.

If the unauthorized person operates the push button, the drive motor 9 is energized by the control unit 10 to rotate in reverse the door wings 3, wherein the control unit 10 preferably stops the driving as soon as, seen in the normal passage direction, the rear door wing 3 confining the unauthorized person has at least substantially reached the middle of the opening 6. It is then guaranteed that the person involved can leave the partially closed zone 5.

Although a card reader 13 is used in the described embodiment to determine whether or not a person is authorized, in which card reader an admission pass has to be inserted, it is also possible to use another type of detector, for example a detector with a transmitting/receiving aerial mounted on the panel 4.

Although a revolving door with four door wings 3 is used in the embodiment described, it is noted that the invention can also be applied in a revolving door with three door wings. Further it is noted that instead of contact mats it is also possible to use an other type of sensor for detecting the presence of a person.

Therefore, the invention is not restricted to the above described embodiment which can be varied in a number of ways within the scope of the invention.

Claims

1. Revolving door, in particular for protecting the access to a room, comprising a revolving shaft, a plurality of door wings attached to the shaft and spaced around it, a pair of opposite panels bordering the door wings and forming a partly closed zone with a first and second opening, a drive motor for the shaft and a control unit for the drive motor, wherein a detecting means is provided for detecting whether or not a person is authorized to access the room, and a first sensor for detecting an unauthorized person entering the zone through the first or second opening respectively, wherein the control unit stops the drive motor in response to the first sensor, **characterized** by a control means operable by an unauthorized person confined between two successive door wings in the sector of the partially closed zone as determined by the (each) panel, said control means being active only if an unauthorized person is confined in said sector and in that case upon operation is adapted to cause the drive motor to drive the shaft in reverse to the passage direction.

2. Revolving door according to claim 1, **characterized** in that the control unit stops the driving in reverse to the passage direction as soon as seen in passage direction the rear door wing confining the unauthorized person has at least substantially reached the middle of the adjacent opening. 5
3. Revolving door according to claim 1 or 2, **characterized** in that warning means are provided indicating to a confined unauthorized person the possibility to operate the control means. 10
4. Revolving door according to claim 4, **characterized** in that the warning means are at least partially accommodated in the control means. 15
5. Revolving door according to anyone of the preceding claims, **characterized** in that the control means is mounted in the ceiling of the revolving door. 20

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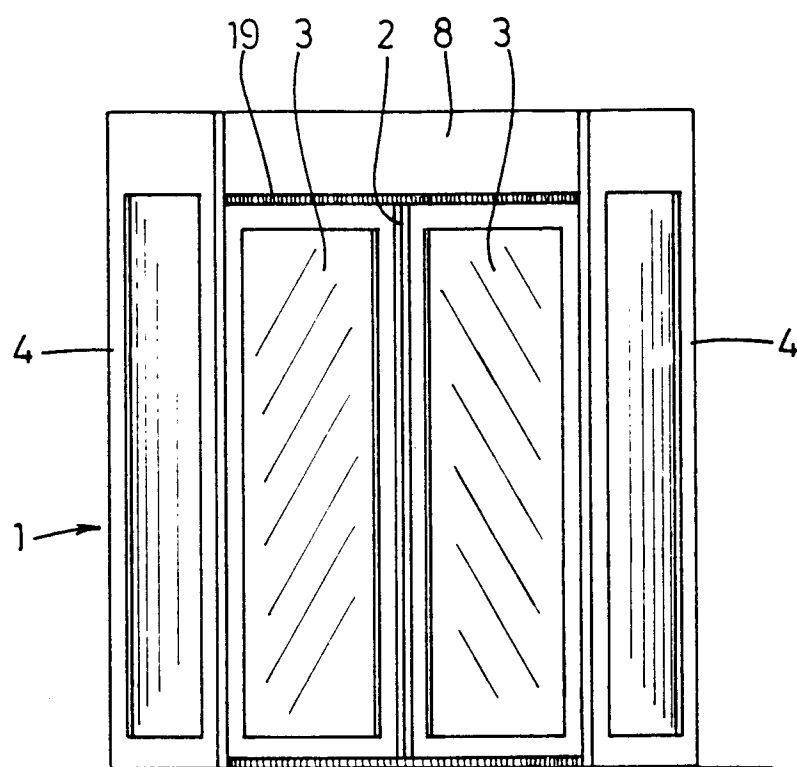


fig.1

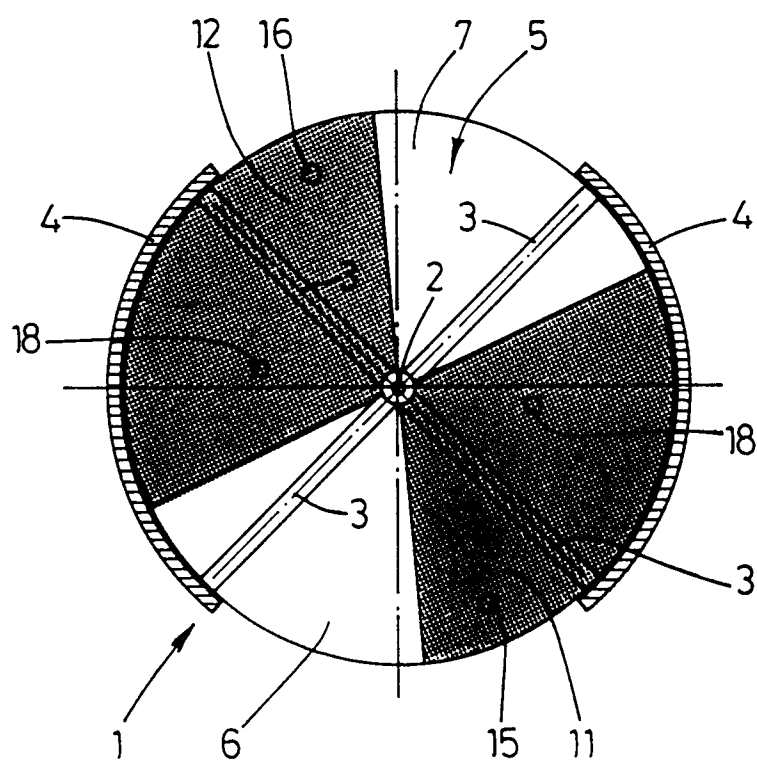


fig.2

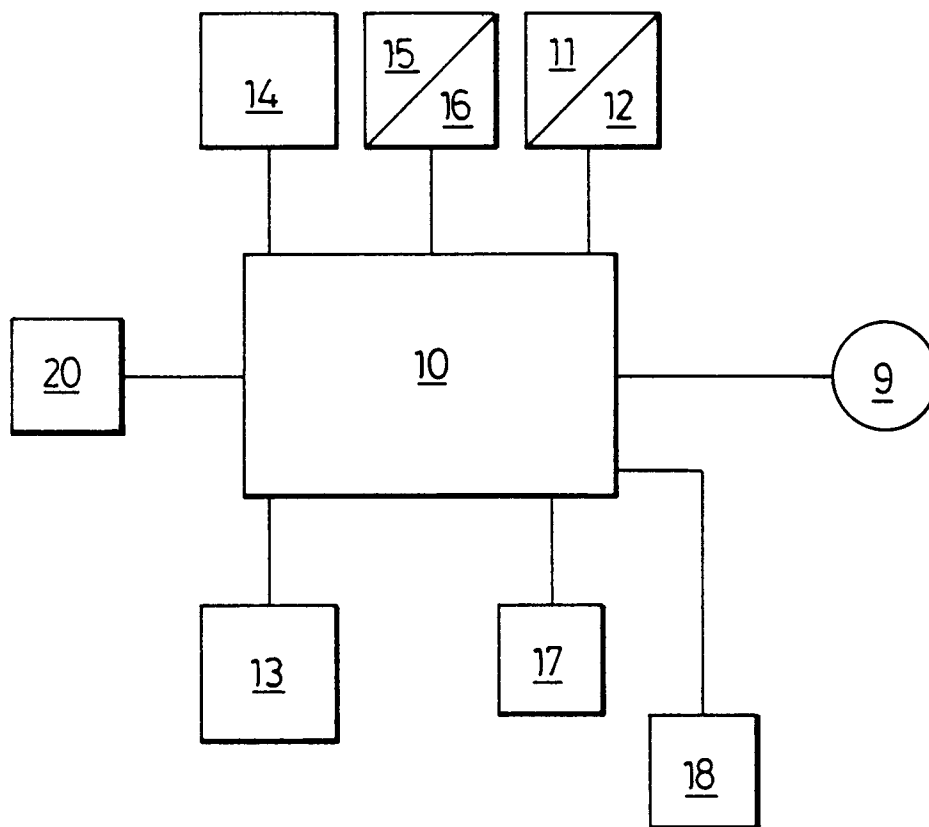


fig.3



European Patent
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EUROPEAN SEARCH REPORT

Application Number

EP 92 20 0404

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)
A	US-A-4 627 193 (SCWARTZ) * abstract * * column 7, line 22 - column 17, line 32; figures 1,2,9,10-12 * ---	1	E05G5/02 E05G5/00
A	US-A-4 341 165 (CALANDRITTI) * column 3, line 40 - line 46 * * column 5, line 34 - line 40; figure 1 * -----	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			E05G E06B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 17 JUNE 1992	Examiner GUILLAUME G. E. P.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			