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NL-1000 HB Amsterdam(NL)(54) **Door.**

(57) A door comprises two opposite stationary walls (4) and a central column (5) positioned in the centre therebetween. Between said walls and column there is defined an entrance and exit passage (10, 11). At least three arms (7) are connected with drive means (8) and are rotatable about a vertical axis of rotation (6), said arms (7) carrying vertical door panels (9) adapted to circulate within the space between the walls (4) and about the central column (5). The door panels (9) are connected to the arms (7) rotatable about a vertical axis (12) and comprising a guide mechanism (13, 14, 15) for maintaining the door panels (9) substantially parallel when they circulate by means of the arms (7).

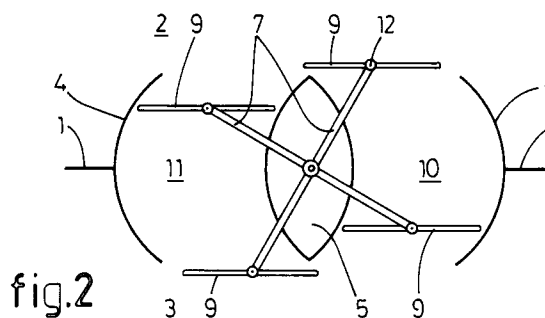


fig.2

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The invention relates to a door comprising two opposite stationary walls and a central column positioned in the centre therebetween, between said walls and column there being defined an entrance and exit passage, and at least three arms connected with drive means and rotatable about a vertical axis of rotation, said arms carrying vertical door panels adapted to circulate within the space between the walls and about the central column.

A known embodiment of such door is the widely used revolving door in which a number of radial door panels are adapted to rotate about a vertical axis of rotation. A further development thereof, in particular for use in circumstances in which there is a need for a large capacity, consists of a door in which the arms with the door panels carried thereby circulate in an oval path of which the longer axis extends in the direction of the passages.

Although such doors have been very satisfactory in practice, it is an object of the invention to provide an improved door.

To obtain this object, the door according to the invention is characterized in that the door panels are connected to the arms rotatable about a vertical axis and comprising a guide mechanism for maintaining the door panels substantially parallel when they circulate by means of the arms.

This door according to the invention has several advantages. First of all, the door panels have an equal and constant speed over the entire surface during their circulation, thereby preventing a "swishing motion" occurring in said door having an oval path when the door panels thereof turn back. Nonetheless, there is obtained a substantially straight passage which is particularly favourable when persons accompanying large objects, such as buggies, wheel chairs and the like, should pass the door. This straight passage can be obtained with parts having only pivot points and no longitudinal guides, which is a great advantage in view of sensitivity to maintenance and failure. A further advantage of the door according to the invention is that the door has a larger width than depth. Mostly, there is more space available within the width, that is in the plain of the outer wall, than in the depth. Consequently, a large capacity can be obtained by selecting a large width without causing problems in the depth of the building.

In one embodiment of the door according to the invention the vertical axis of rotation is positioned symmetrically between the stationary walls and the door panels are connected in their centre to the respective arms, while on the other hand it is possible that the vertical axis of rotation is positioned outside the centre between the stationary walls and the door panels being connected outside of their centre to the respective arms. If, in this case, the offset of the vertical axis of rotation with

respect to the centre of the stationary walls is equal to the offset of the vertical axis from the centre of the door panels, then the path of the door panels remains the same. Placing the vertical axis of rotation of the arms outside the centre may lead to advantages in view of the formation of a free emergency exit in cases of emergency, such as fire or the like, because in that case a larger emergency exit can be provided when the door panels pivot about their vertical axis.

Preferably, the guide mechanism for the door panels rotates together with the arms, wherein for example the guide mechanism has a stationary guide means positioned concentrically about the vertical axis of rotation, said guide means being connected through transmission means to a guide means fixed at the axis of the door panel. In this manner the rotation of the arms about the vertical axis of rotation automatically cause a rotation of the door panels with respect to the arms. Conceivable examples of the guiding mechanism are a chain or belt transmission, a shaft transmission or a linkage gear.

The invention will hereafter be elucidated with reference to the drawing showing a plurality of embodiments of the door according to the invention by way of example.

Fig. 1 shows through a very schematic plan view the principle of a first embodiment of the door according to the invention.

Fig. 2 is a view corresponding to that of Fig. 1, wherein the door is, however, in another position.

Fig. 3 is a vertical sectional view of the door of Fig. 1 with the door panels in another position.

Fig. 4 is a view corresponding to that of Fig. 1, wherein the door is, however, in a position to form an emergency exit.

Fig. 5 shows an alternative of the revolving door according to claim 4.

Fig. 6 is a plan view corresponding to that of Fig. 1 and showing a second embodiment of the door according to the invention.

Fig. 7 is a view corresponding to that of Fig. 6, wherein the door is, however, in a position to form an emergency exit.

The door according to the invention as shown in the drawings is intended as entrance and exit of a building, of which the outer wall is schematically indicated by 1 and of which the inner space is indicated by reference numeral 2 so that the open air is at position 3. Of course, it is also possible to use the door according to the invention internally of a building.

The door according to the invention comprises two outer stationary walls 4 extending through a segment of a circle and being positioned opposite to each other and substantially transverse to the outer wall of the building. In the middle between

the walls 4 a central column 5 is positioned consisting of two abutting wall parts extending through a segment of a circle of which the curvature corresponds to the curvature of the walls 4.

Symmetrically in the middle between the walls 4 is a vertical rotating shaft 6 carrying four horizontal arms 7 arranged like a rectilinear cross. In the embodiment shown, which is purely schematical and given only by way of example, the arms 7 are fixed to the rotating shaft 6 which is hollow and rotatable about its vertical axis, for example by means of an electric motor 8.

From each arm 7 there is suspended a door panel 9 adapted to circulate through the entrance and exit passages 10 and 11 defined between the walls 4 and the central column 5, when the arms 7 rotate about the rotating shaft 6. As is also shown in Fig. 3 that each door panel 9 is rotatably suspended from the respective arm 7 by means of a vertical shaft 12.

According to the invention it is intended, when the door rotates about the rotating shaft 6, to keep the door panels 9 substantially parallel to each other and to the outer wall 1 of the building, which is shown by a comparison of Fig. 1 and 2. This means that the door panels 9 rotate with respect to their corresponding arms 7 about the shaft 12. In order to obtain this parallel motion of the door panels 9 there is provided a guide mechanism for the door panels which, in the embodiment shown schematically, consists of a chain or belt transmission which is provided with a wheel 13 fixed to the shaft 12 of each door panel 9, a belt, chain or such endless transmission means 14 and a respective wheel 15 mounted on a stationary shaft 16 which is aligned with the vertical rotating shaft 6. If the transmission ratio of this transmission is 1:1, then this guide mechanism automatically maintains each door in parallel position. Of course, also other guide mechanisms are conceivable, for instance a guide mechanism in which the chain or belt 14 is replaced by a transmission shaft extending parallel to the arm 7 and being in engagement with shafts 12 and 16 by right angled gears. One can also think of a linkage gear or stationary guide rails for directly guiding the door panels 9.

As is shown by Fig. 4, the door panels 9 may be rotated with respect to their corresponding arms 7, for instance by means of a separate drive in their guide mechanism, that a free emergency passage is formed in case of an emergency.

Fig. 5 shows an alternative of Fig. 4 wherein the door panels 9 consist of two pivotable panel parts 9a and 9b pivotable about a vertical pivot 17 and adapted to fully or partly collapse in case of an emergency situation.

Fig. 6 and 7 show an alternative embodiment of the door according to the invention in which the

rotating shaft 6 of the arms 7 is positioned asymmetrically, that is outside the centre between the walls 4. The shafts 12 between the arms 7 and the respective door panels 9 are offset the same distance from the centre of the door panels 9, so that the door panels 9 will follow the same path as the door panels according to the first embodiment of Fig. 1 and 2, and consequently the walls 4 and the central column 5 may remain the same. This embodiment has the advantage that in case of an emergency situation the door panels 9 may be rotated such with respect to their respective arms 7 that very wide emergency passages are caused which are substantially equal to the passages 10 and 11.

From the foregoing it will be clear that the invention provides a door, offering a straight passage between the door panels 9, and which has smoothly moving door panels 9, no longitudinal guides which are sensitive to maintenance and offers a maximum capacity with a minimum of floor space, in particular in the depth of the building.

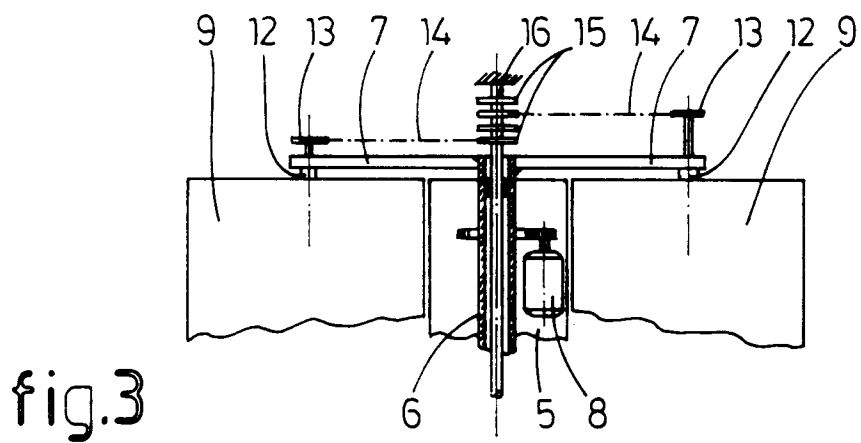
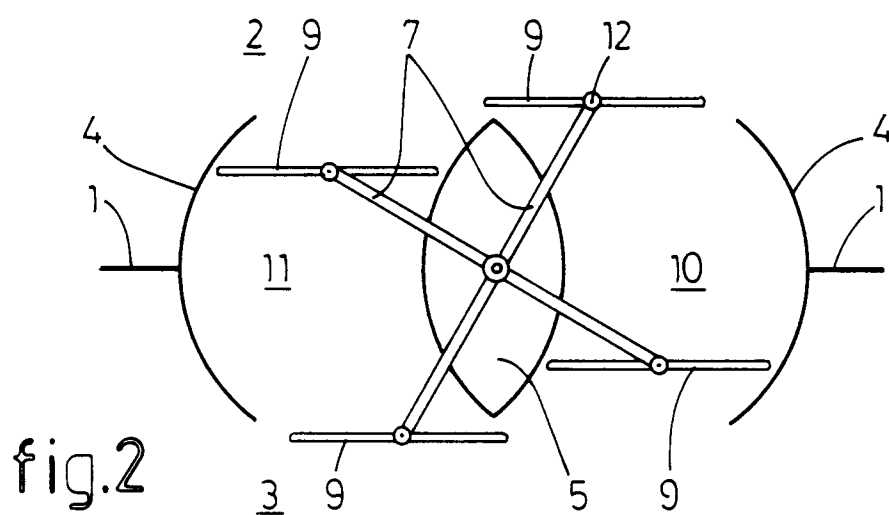
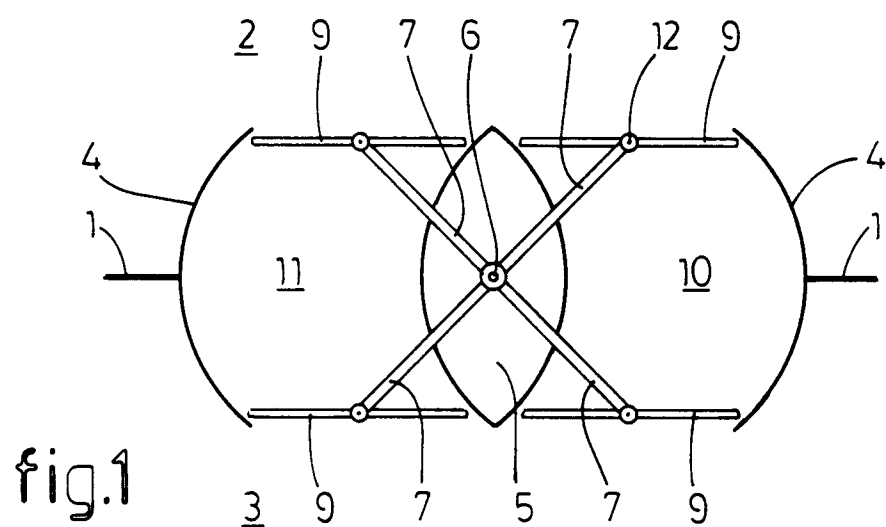
The invention is not restricted to the embodiment shown in the drawing and described herein before which may be varied in different manners within the scope of the invention. For instance it would principally also be possible to replace the arms rotating about the vertical axis of rotation by another circulation means circulating for instance by means of an endless drive means within a guide path. Instead of three or four arms there may also be provided a single rotating disc.

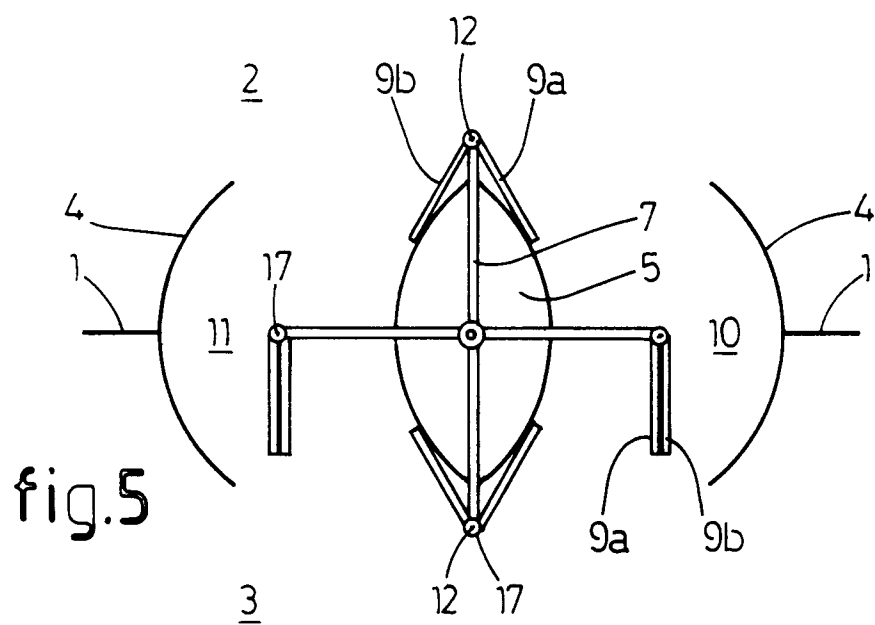
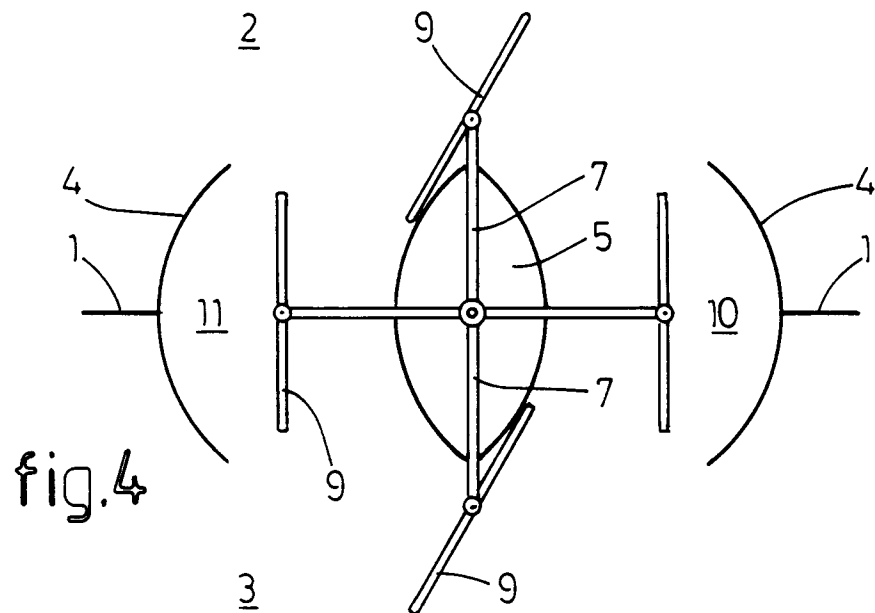
Claims

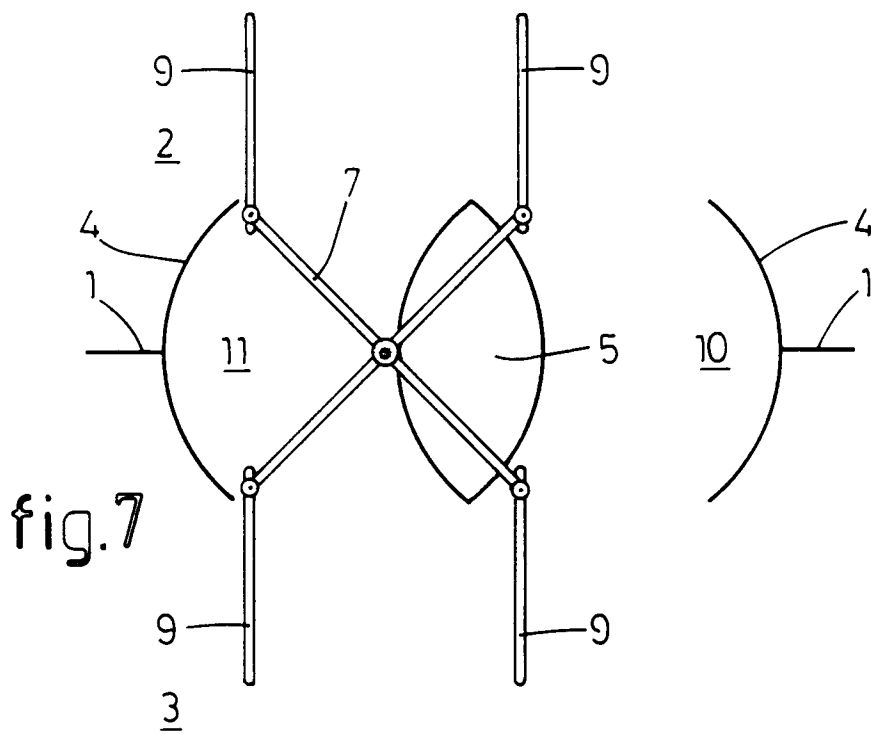
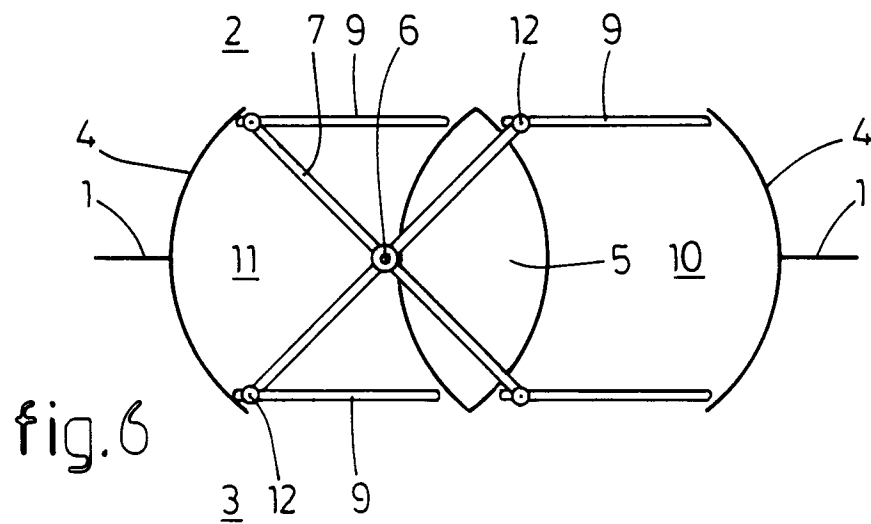
1. Door comprising two opposite stationary walls (4) and a central column (5) positioned in the centre therebetween, between said walls and column there being defined an entrance and exit passage (10, 11), and at least three arms (7) connected with drive means (8) and rotatable about a vertical axis of rotation (6), said arms (7) carrying vertical door panels (9) adapted to circulate within the space between the walls (4) and about the central column (5), **characterized** in that the door panels (9) are connected to the arms (7) rotatable about a vertical axis (12) and comprising a guide mechanism (13, 14, 15) for maintaining the door panels (9) substantially parallel when they circulate by means of the arms (7).
2. Door according to claim 1, wherein the vertical axis of rotation (6) is positioned symmetrically between the stationary walls (4) and the door panels (9) are connected in their centre to the respective arms (7).

3. Door according to claim 1, wherein the vertical axis of rotation (6) is positioned outside the centre between the stationary walls (4) and the door panels (9) are connected outside of their centre to the respective arms (7). 5
4. Door according to one of the preceding claims, wherein the guide mechanism (13, 14, 15) for the door panels (9) rotates together with the arms (7). 10
5. Door according to claim 4, wherein the guide mechanism (13, 14, 15) has a stationary guide means (15) positioned concentrically about the vertical axis of rotation (6), said guide means (15) being connected through transmission means (14) to a guide means (13) fixed at the axis (12) of the door panel (9). 15
6. Door according to claim 5, wherein the guide mechanism (13, 14, 15) includes a chain or belt transmission, a shaft transmission or a linkage gear. 20
7. Door according to one of the preceding claims, wherein the door panels (9) are pivotable about their vertical axis (12) to an emergency position. 25
8. Door according to one of the preceding claims, wherein the door panels (9) comprises two door panels (9a, 9b) pivotable about a vertical pivot (17). 30
9. Door comprising two opposite stationary walls (4) and a central column (5) positioned in the centre thereof, between said walls and column there being defined a back and forth passage (10, 11), and at least three arms circulation means (7) connected to a drive means (8) and carrying vertical door panels (9) adapted to circulate within the space between the walls (4) and about the central column (5), **characterized** in that the door panels (9) are connected to the arms (7) rotatable about a vertical axis (12) and comprising a guide mechanism (13, 14, 15) for maintaining the door panels (9) substantially parallel when they circulate by means of the circulation means (7). 35
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EUROPEAN SEARCH REPORT

Application Number

EP 92 20 1320

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	GB-A-2 119 429 (EMI LTD) * the whole document * ---	1,2,4-6,9	E06B3/90
A	GB-A-1 084 708 (RIDDLE) * page 1, line 70 - page 2, line 99; figures 1-7 * ---	1,2,4-6,9	
A	DE-C-155 417 (WERTHEIM) * the whole document * ---	1,2,9	
A	GB-A-167 013 (BIRTWISTLE) * page 2, line 46 - line 82; figures * ---	1,3,7,9	
A	US-A-1 417 372 (FRIEDLAND) ---		
A	FR-A-2 610 361 (LTR. S.A.) -----		
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			E06B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 16 NOVEMBER 1992	Examiner DEPOORTER F.
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