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(54) MOVABLE GUARDRAIL

(57) The invention relates to devices of a controlling passage type. The movable guardrail comprises a bar 2 which is fixed rotatably to an immovable loadbearing structure 1 and to which at least one door 3 is rotatably fixed, and a synchronizing mechanism consisting of a single gear 4 fixed immovably relative to the immovable load-bearing structure, gears 5 fixed immovably relative to the corresponding doors, and gears 6 fixed to the bar between the above-mentioned single gear 4 and corresponding gear 5, which is immovable relative to the door.

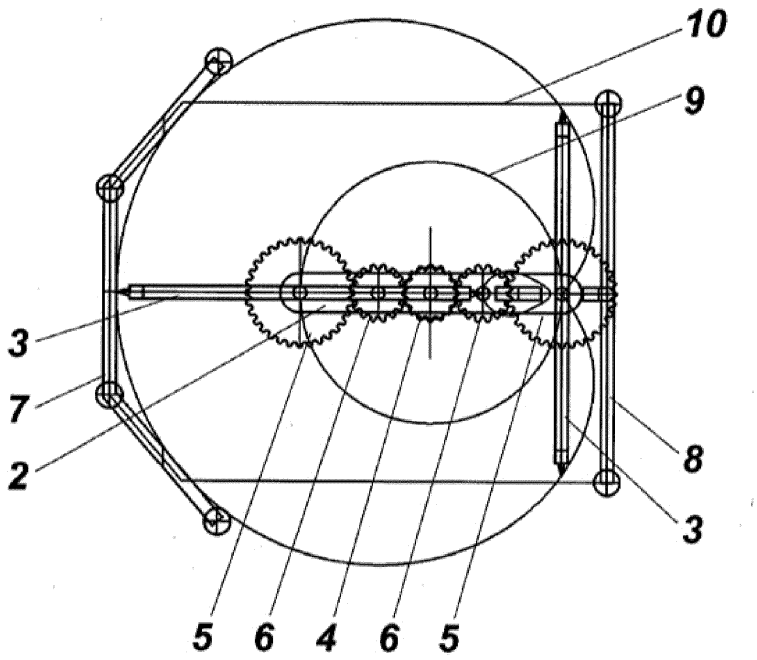

Fig. 2

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Description

BACKGROUND OF THE INVENTION

[0001] A prior art movable guardrail, or turnstile, comprises a rotatable post secured on a base and is provided with pin elements (Russian Application No. 2006109540 of October 10, 2007).

[0002] The prior art device is deficient because of its low functional capabilities, as the turnstile structure cannot prevent unauthorized passage and has a low reliability attributable to a mechanism for turning the pin elements it uses.

SUMMARY OF THE INVENTION

[0003] The technical result of this invention consists in correcting the deficiencies of the prior art invention and reducing the area occupied by the movable guardrail.

[0004] The claimed technical result is achieved in a movable guardrail comprising a rotatable load-bearing element secured on a base and provided with at least one rotatable passage limiter and a synchronizing mechanism consisting of a single gear secured immovably relative to the base, gears secured immovably relative to their respective passage limiters, and gears secured on the loadbearing element between said single gear and a respective gear secured immovably relative to the passage limiter.

[0005] The guardrail may be provided with a latch to prevent rotation of the loadbearing element, and the synchronizing mechanism may be designed to allow the load-bearing element to rotate in one direction and/or the direction of rotation thereof to be reversed.

[0006] The passage limiter may be designed, depending of the location of the movable guardrail, as a door or formed by pin elements.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] The idea of the invention is illustrated by the following drawings:

FIG. 1 is a diagrammatic view of the synchronizing mechanism when one passage limiter is used; FIG. 2 is a view of FIG. 1 with two passage limiters used; FIG. 3 is a diagrammatic view of a turnstile having one door; FIG. 4 is a diagrammatic view of a turnstile having two doors; FIG. 5 shows the position of a single passage limiter during operation of the movable guardrail; FIG. 6 shows the position of two passage limiters during operation of the movable guardrail; FIG. 7 shows the position of three passage limiters during operation of the movable guardrail; FIG. 8 shows stages in the operation of the movable guardrail having a shortened passage limiter.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0008] The claimed movable guardrail (turnstile) comprises a rotatable bar 2 (loadbearing element) secured on an immovable load-bearing structure 1 (base) and carrying at least one door 3 (passage limiter) secured rotatably thereon and a synchronizing mechanism comprising a single gear 4 secured immovably relative to load-bearing structure 1, gears 5 secured immovably relative to their respective doors 3, and gears 6 secured on bar 2 between said single gear 4 and respective gear 5 that is immovable relative to door 3.

[0009] Bar 2 may carry a mechanism (not shown) to permit bar 2 to be turned in one direction, reverse the direction in which bar 2 turns, or lock bar 2 against turning. As door 3 turns in a circle around a pivotal point where bar 2 is connected to load-bearing structure 1, door 3 turns in the same direction as bar 2 at a gear ratio set by the synchronizing mechanism (gears 4, 5, and 6). Gears 4 and 5 have a gear ratio of 2.

[0010] Load-bearing structure 1 is mounted securely on posts 7 and 8 of the guarding elements. The synchronizing mechanism is closed from below by a central protective screen 9 secured to load-bearing structure 1 and by an external protective screen 10 supported by posts 7 and 8 of the guarding elements.

[0011] As door 3 moves along a path set by bar 2 and turns simultaneously relative to the point where it is connected to bar 2 (FIG. 5), it changes its position such that a space sufficient for the passage of one person is always maintained between the guardrail and door 3, the inlet and outlet being closed alternately by door 3. The gaps between door 3 and the guardrail at any point of movement of door 3 are too narrow for anyone to pass in the opposite direction.

[0012] The width of door 3 defines the free space between door 3 and the guardrail large enough for one person only. The dimensions of door 3 and bar 2 serve the purpose of the structure - organizing one-way passage, with every person checked and passed on or organizing one-way passage of increased passage capacity, in which case the size of the structure is enlarged such that the free space is enough for several persons to pass through simultaneously, the gaps between the door and guardrail preventing anyone from going in the opposite direction.

[0013] A two-door turnstile shown in FIG. 2 and FIG. 4 is a modification of the one-door turnstile design. The two-door device has a straighter path to be followed by a person going through the turnstile. Doors 3 have an identical size and are placed at an angle of 90 degrees to each other at any moment in time. Operation of a two-door device does not differ from that of a one-door device in principle.

[0014] The synchronizing mechanism comprises gears 5 secured immovably relative to a respective door 3, a gear 4 secured immovably relative to load-bearing structure 1, and gears 6 secured on bar 2. The gear ratio

of gears 4 to gear 5 is equal to 2. The synchronizing mechanism is closed from below with screens 9 and 10.

[0015] Both doors 3 connected by bar 2 and the synchronizing mechanism turn along a circular path in the horizontal plane around the points where doors 3 are connected to bar 2 and turn simultaneously relative to their point of connection to bar 2, the synchronizing mechanism maintaining doors 3 in a vertical attitude to each other at any point in time. As doors 3 turn they define a space sufficient for the passage of one person in a predetermined direction and the inlet and outlet are closed alternately by doors 3. The gaps between doors 3 and the guardrail are small at any point in time during rotation of the doors and prevent anyone from going in the opposite direction. The width, thickness, and shape of the doors are such that the doors do not cross in space during rotation.

[0016] The width of doors 3 defines a free space between doors 3 and the guardrail for a person to be in. The dimensions of doors 3, the guardrail, and bar 2 are such that there is enough free space for a person between doors 3 and the guardrail at any moment of movement of doors 3 along a set path. The width of doors 3 is chosen depending on the purpose of the structure - organizing one-way passage with every person checked or organizing one-way passage at an increased capacity, in which case the dimensions are chosen such that the space between doors 3 and the guardrail is sufficient for simultaneous passage of several persons. The gap opening between doors 3 when the device is not in operation is closed by auxiliary guardrail elements.

[0017] A three-door device shown in FIG. 7 is a further modification of a one-door device and operates on the same principle. The doors are placed at an angle of 60 degrees to one another, and the resultant gap formed between the doors is closed with an auxiliary guardrail.

[0018] Modifications of the device having four or more doors achieve the claimed result as well, but a larger number of doors increases the size of the device and causes some inconveniences in operation.

[0019] Shorter doors help reduce the quantity of materials needed to make the device. Movable mechanisms in a short-door device may be placed at the top and/or bottom of the device, and the passage limiters are connected to the turning bar by additional rods.

Claims

1. A movable guardrail comprising a load-bearing element secured rotatably on a base, at least one passage limiter being rotatably secured thereof, and a synchronizing mechanism consisting of a single gear secured immovably relative to the base; gears secured immovably relative to the respective passage limiters, and gears secured on the load-bearing element between said single gear and a respective gear that is immovable relative to the passage limiter.

2. A movable guardrail of claim 1, further provided with a latch preventing rotation of the load-bearing element.

3. A movable guardrail of claim 1, wherein the synchronizing mechanism can rotate the load-bearing element in one direction and/or reverse the direction of rotation thereof.

4. A movable guardrail of any one of claims 1 to 3, wherein the passage limiter is a door or is formed by pin elements.

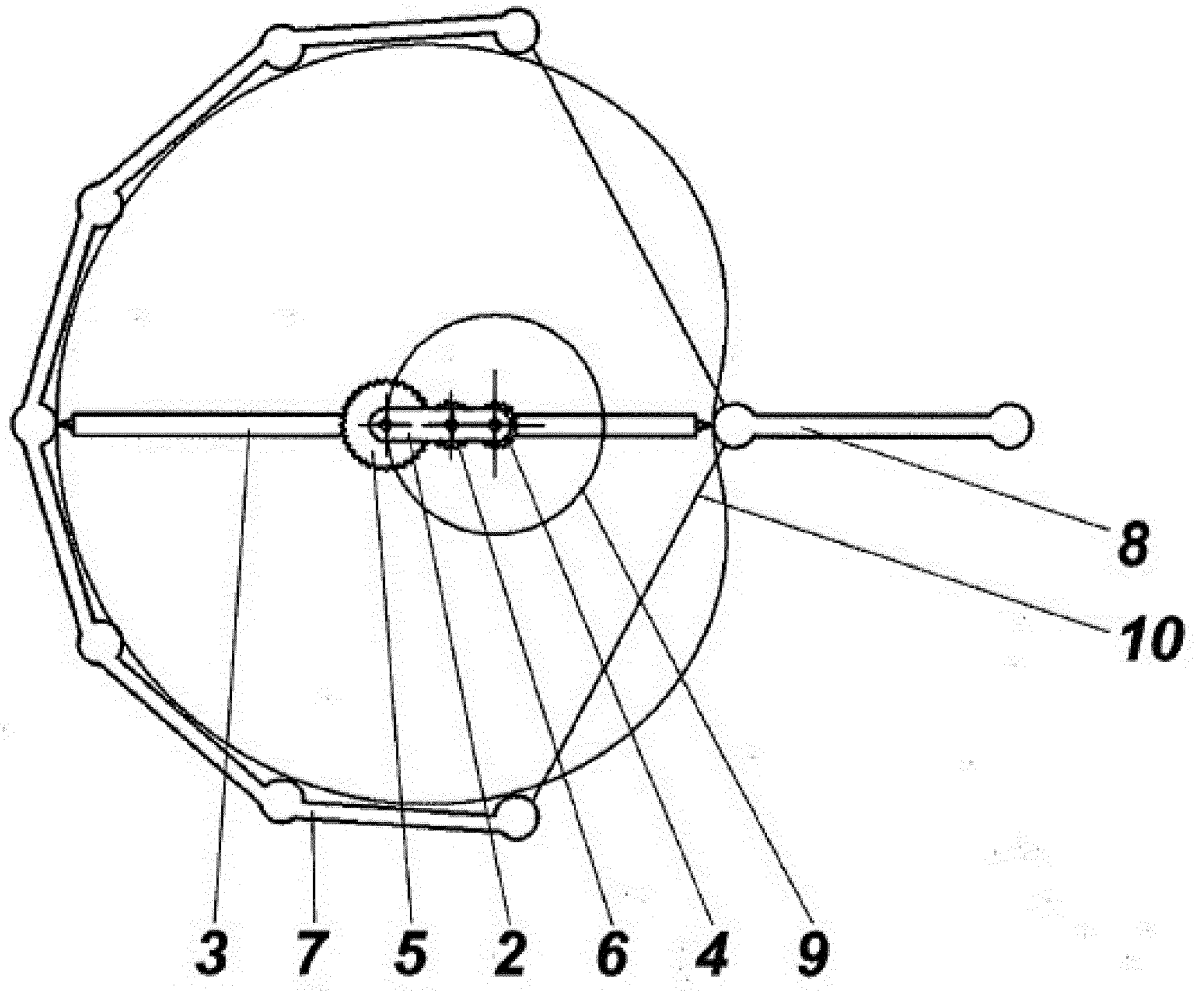

Fig. 1

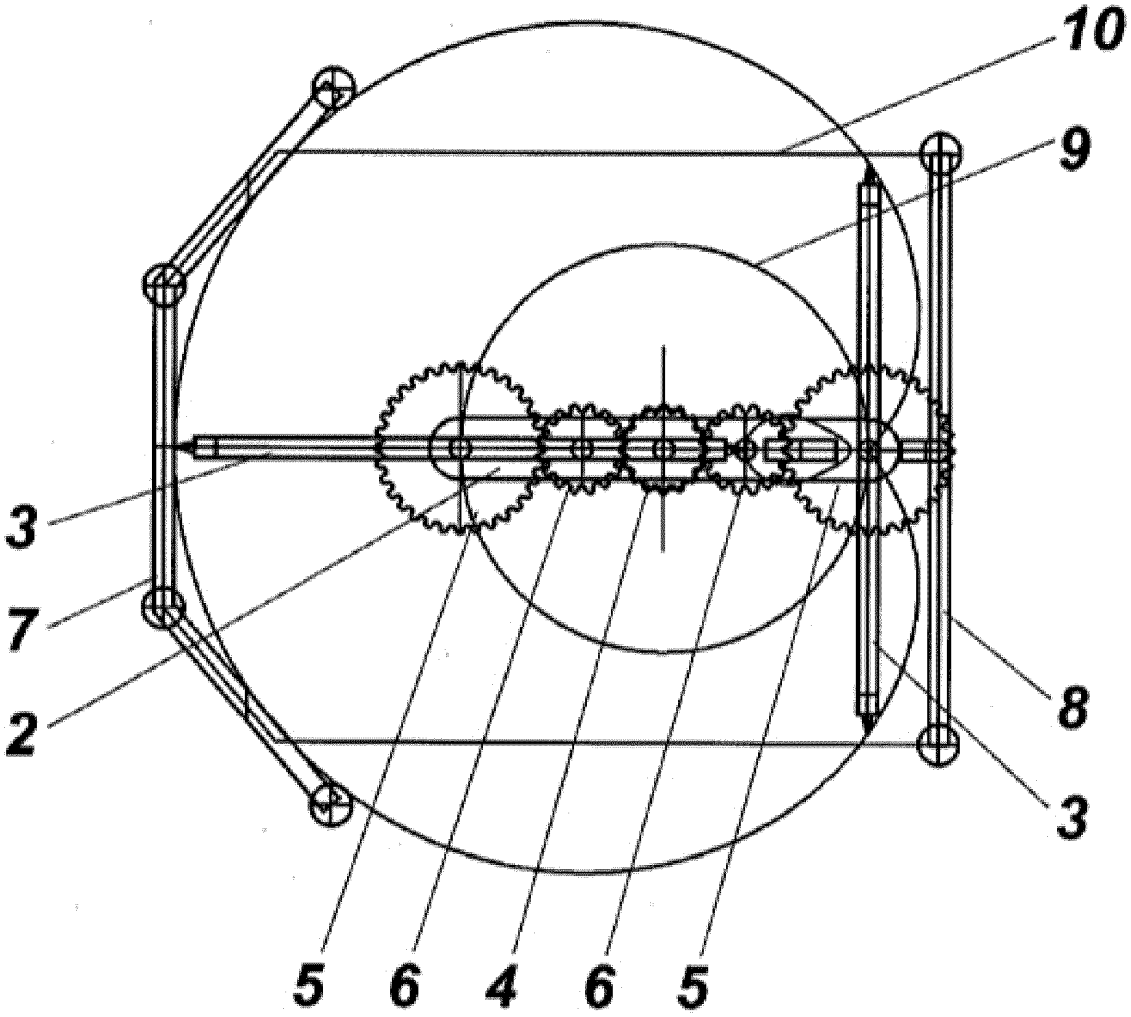

Fig. 2

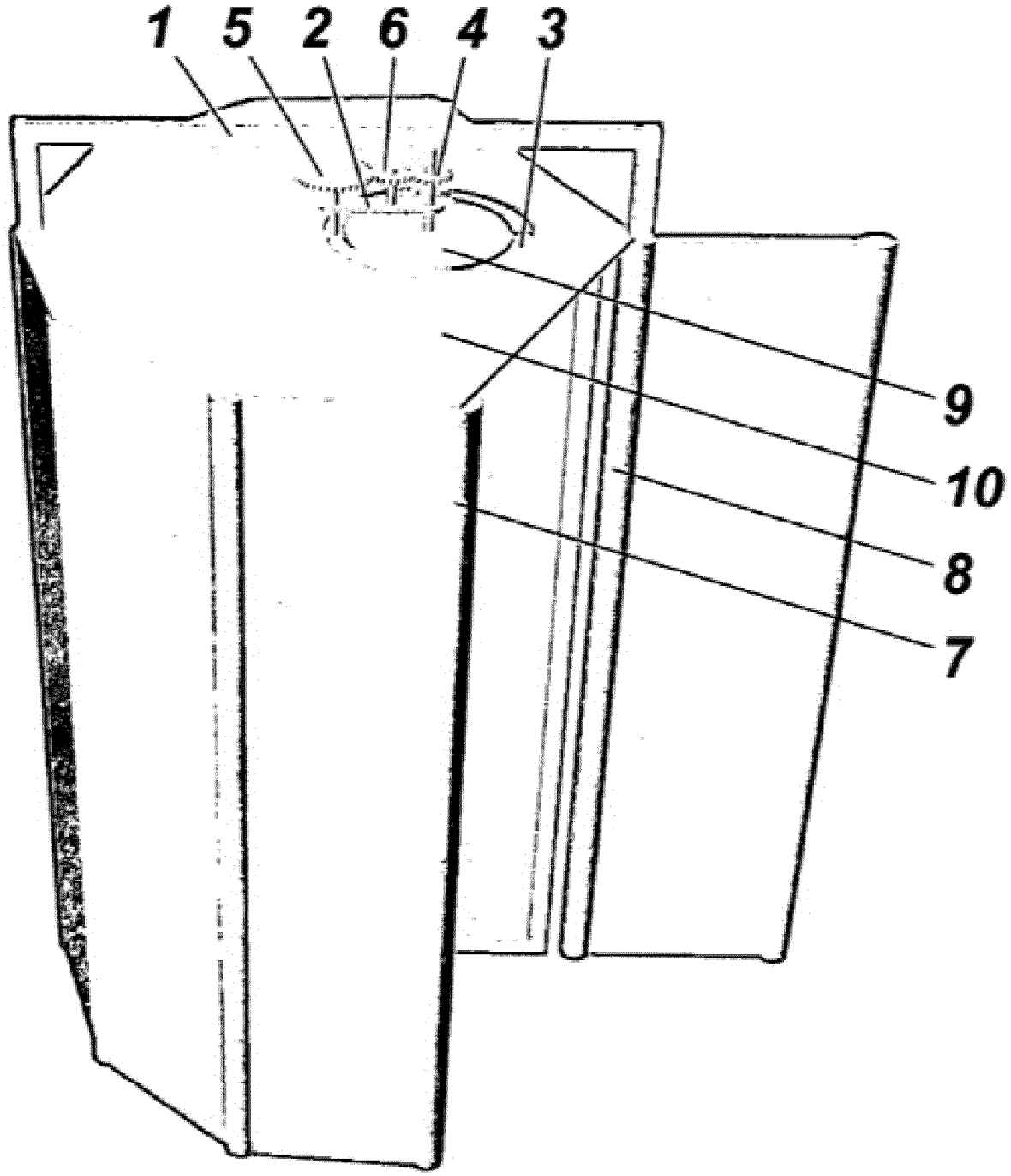

Fig. 3

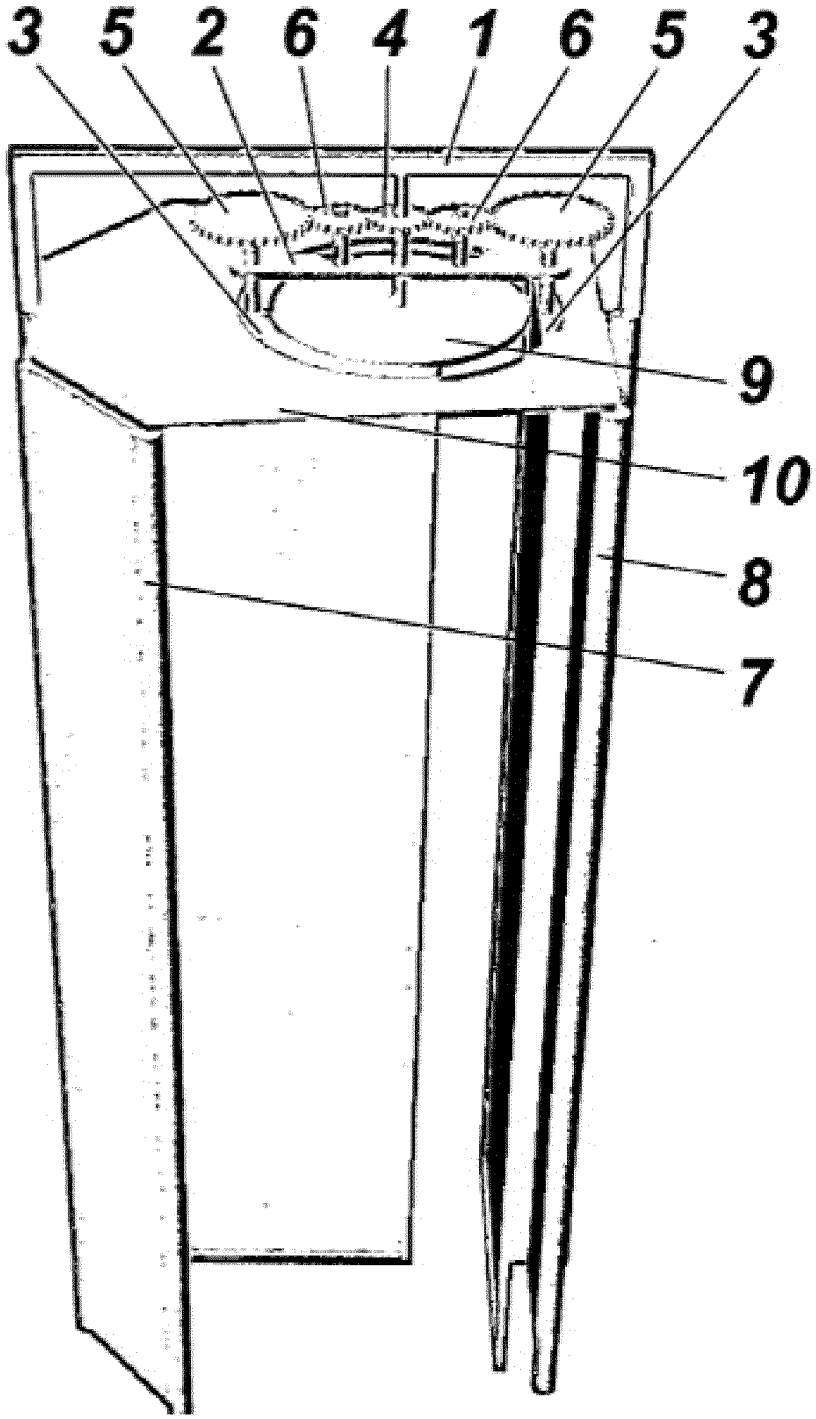

Fig. 4

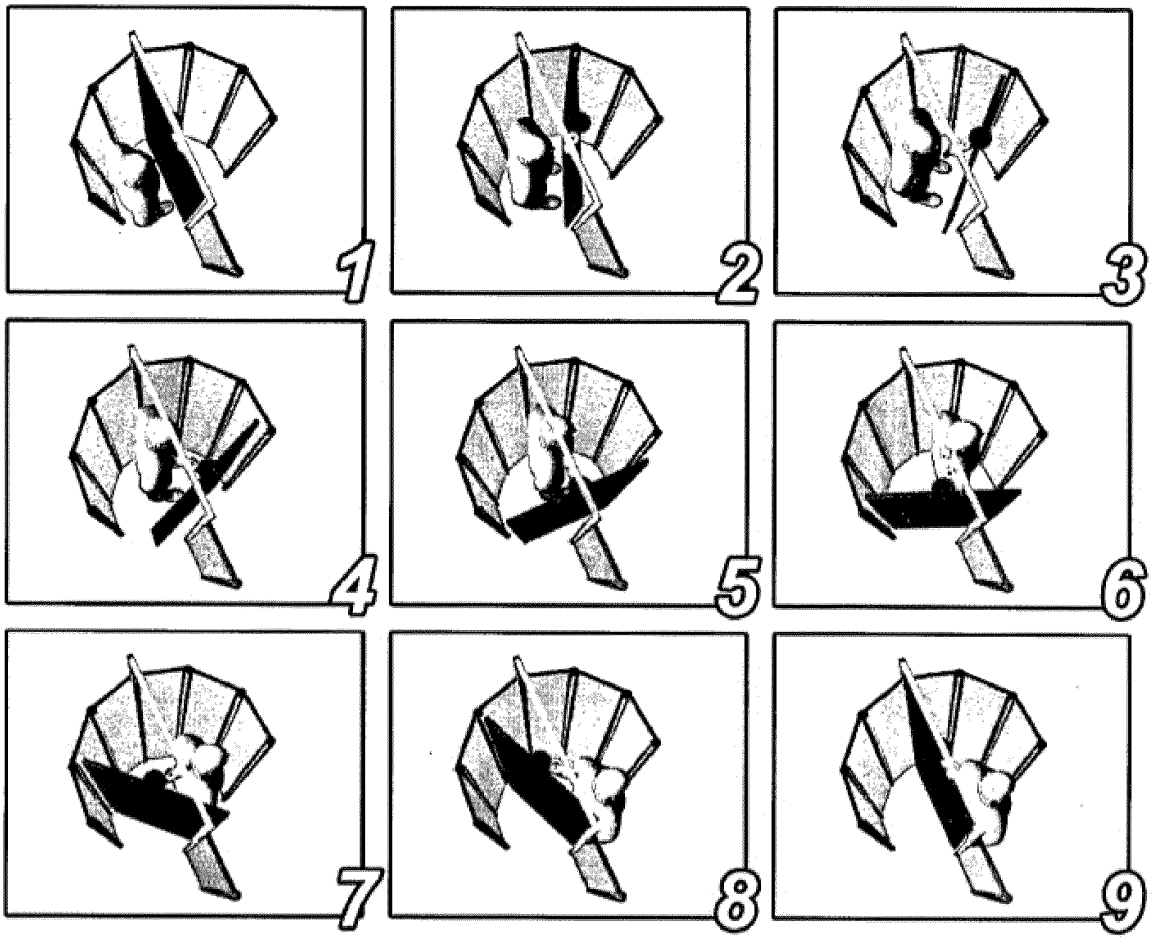

Fig. 5

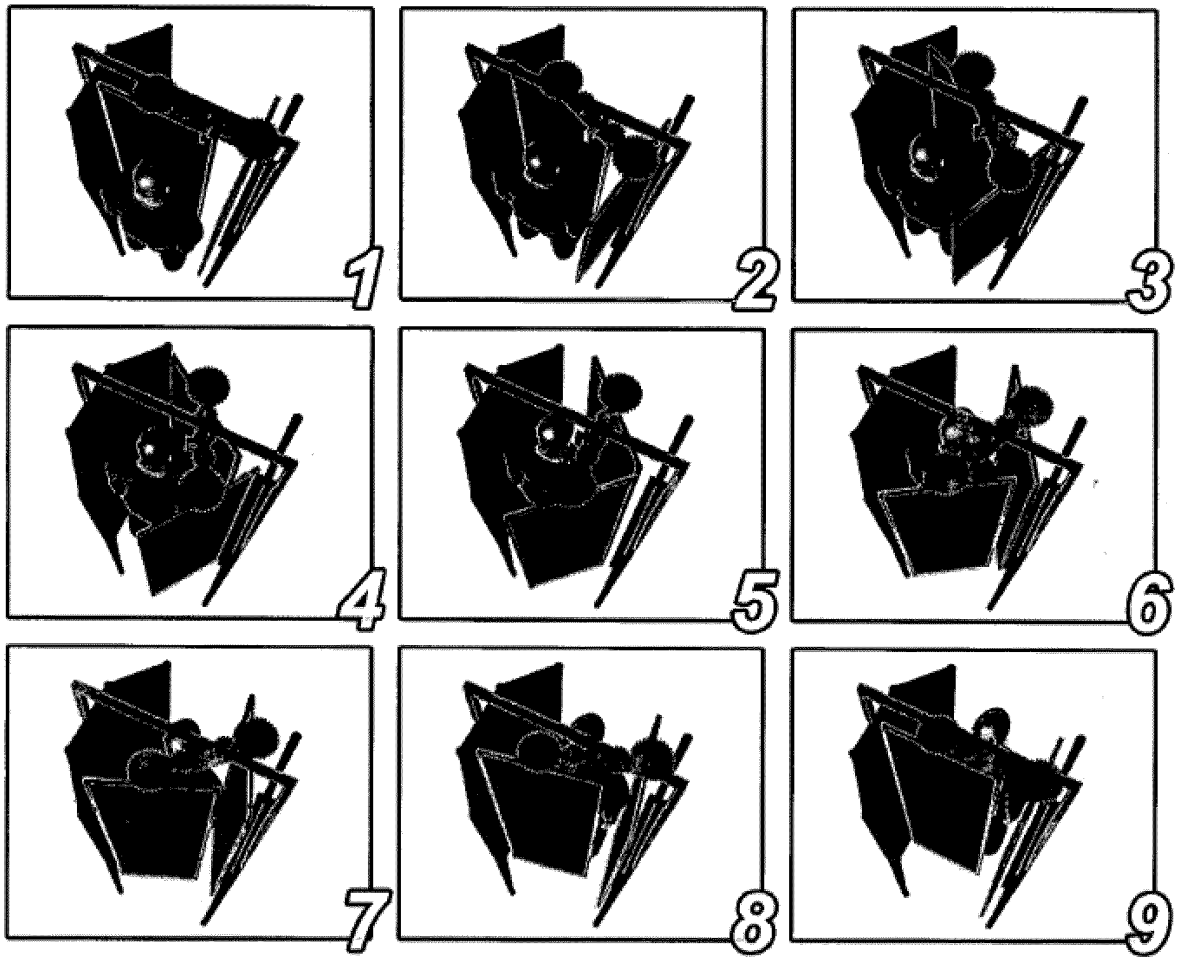

Fig. 6

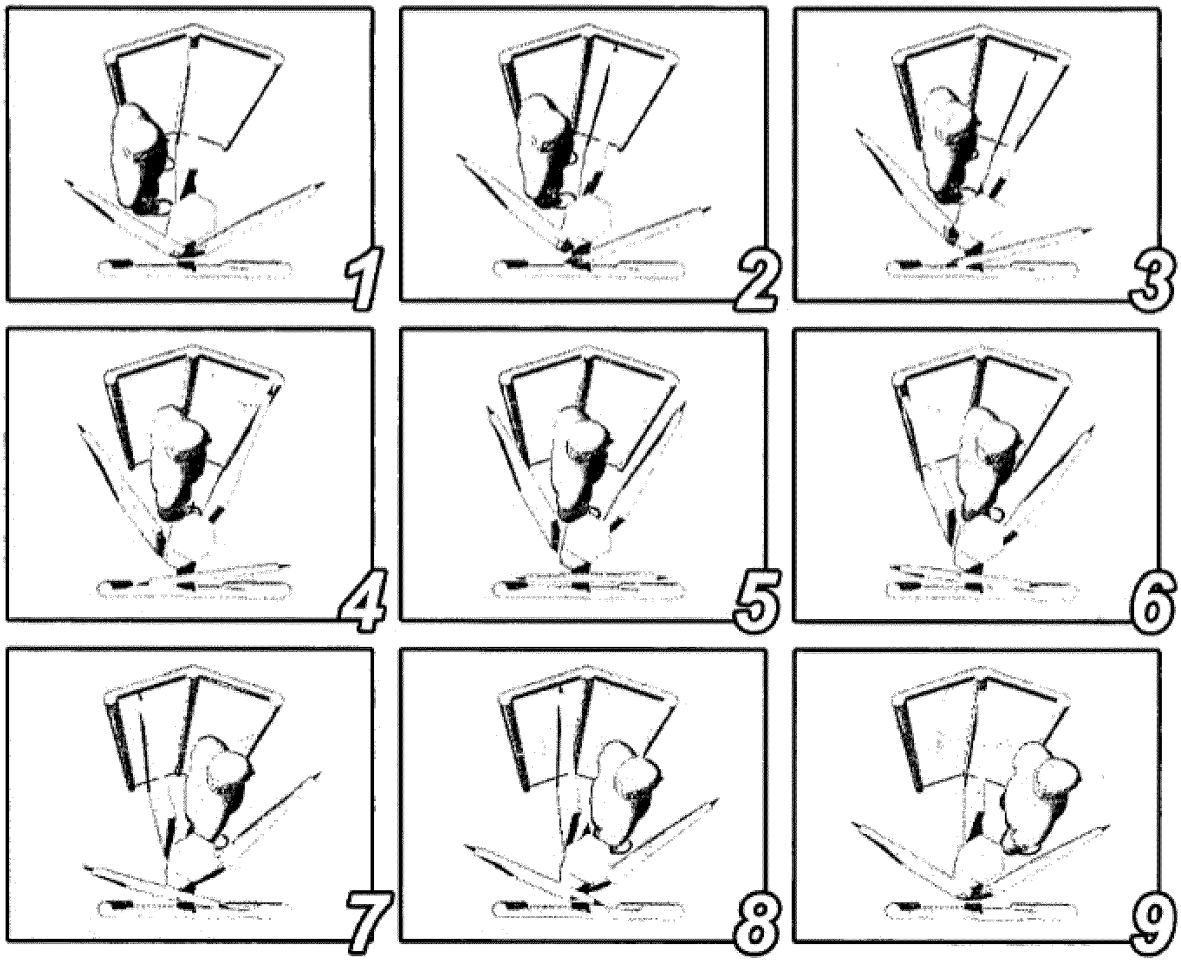

Fig. 7

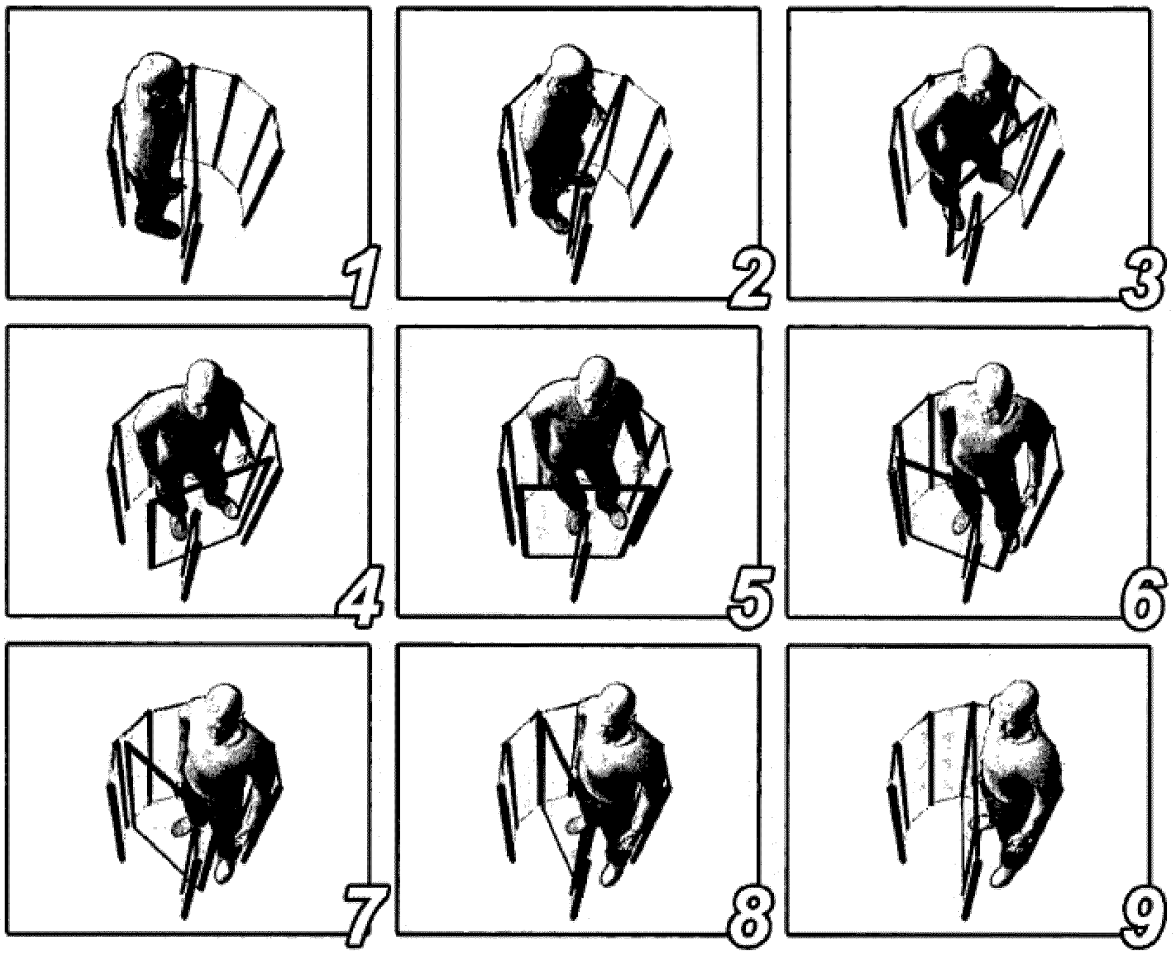

Fig. 8

INTERNATIONAL SEARCH REPORT

International application No.
PCT/RU 2010/000579

A. CLASSIFICATION OF SUBJECT MATTER

E06B 11/08 (2006.01), E0SF 13/00 (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

E06B 3/00, 11/00, 11/02, 11/08, E05F 15/00, 13/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

DWPI, EAPATIS, Esp@ce, Esp@cenet, PAJ, PCT, PatSearch, RUPTO, USPTO

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	RU 2327023 C2 (OBSCHESTVO S OGRANICHENNOY OTVETSTVENNOSTJU "SOTSIALNIE SISTEMI") 20.06.2008	1-4
A	FR 2534963 A1(ENTREPRISE VOISIN) 27.04.1984	1-4
A	EP 0718460 A2 (KABA GALLENSCHUTZ GMBH) 26.06.1996	1-4
E	RU 2412323 C1(GNEZDILOV ALEXEY VLADIMIROVICH) 20.02.2011	1-4

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"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	Date of mailing of the international search report
17 June 2011 (17.06.2011)	23 June 2011 (23.06.2011)
Name and mailing address of the ISA/	Authorized officer
Facsimile No.	Telephone No.

Form PCT/ISA/210 (second sheet) (July 1998)

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- RU 2006109540 **[0001]**