(51) International Patent Classification:
E06B 3/40 (2006.01)  E06B 1/00 (2006.01)
B60J1/00 (2006.01)  E06B 1/04 (2006.01)
B60J1/14 (2006.01)  E06B 3/26 (2006.01)
E05D 15/48 (2006.01)

(21) International Application Number: PCT/IB2016/055228
(22) International Filing Date: 1 September 2016 (01.09.2016)
(25) Filing Language: English
(26) Publication Language: English
(30) Priority Data: 91228 13 July 2016 (13.07.2016) PA

(71) Applicant: UNIVERSIDAD TECNOLÓGICA DE PANAMÁ [PA/PA]; Avenida Universidad Tecnológica de Panama, Via Puente Centenario, Campus Metropolitano Victor Levi Sasso, Corregimiento de Ancon, Ciudad de Panama (PA).


Published:
— with international search report (Art. 21(3))
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2)(h)
— upon request of the applicant, before the expiration of the time limit referred to in Article 21(2)(a)

(54) Title: ROTATING WINDOW ASSEMBLY

(57) Abstract: Rotating window assembly made up of an assembly of a metal frame with a glass window in its interior, which in turn comprises an upper shaft and a lower shaft parallel to the upper shaft, rotational shafts fixed to the lintel of the window frame, to be linked to a midpoint of the shafts of the frame assembly and enable rotation by means of said shafts, and a fastening stop to maintain the frame assembly in a fixed position with respect to the window frame. The assembly allows the windows to move in a rotational manner, such that tasks that involve handling or cleaning the window from the inside of a building may be performed without the need to use suspended structures as a way to access the outer face of said windows.
ROTATING WINDOW ASSEMBLY

OBJECT OF THE INVENTION

The invention consists of a glass-resistant metal frame assembly with a central shaft to provide a central rotational point for the glass of windows and stained glass of tall buildings, such that this assembly can rotate on its own axis when handled by humans or by automated systems. This invention has the ability to alternate the faces of the glass of the window, such that a person may have access to both sides by rotating the window from the inside of the building, locale or living space and, therefore, by rotating the window, the sides can be changed without the need to use suspended structures.

BACKGROUND OF THE INVENTION

Nowadays, the global trend is to use renewable energy to help reducing our dependency on fossil fuels, thereby reducing pollution. The extensive use of windows to capture natural light has led to serious problems with regard to maintenance works and cleaning, especially on tallest buildings.

Therefore, due to the difficulty of this maintenance work and cleaning, it is necessary to find alternative ways to perform these tasks without putting human lives at risk.

One of the ways in which these tasks are currently carried out is by placing supports on buildings at the highest points of the buildings and suspending structures from those points so that maintenance personnel can move up or down on the outside of the building.

The development of new designs of windows and fastening frames allows maintenance works on the glass of the windows to be carried out, regardless of the height of the building, given that dangerous suspended structures are no longer be required.

The rotating window assembly facilitates cleaning tasks, since a metal frame with solid shafts enables the sides of the window to be moved, changing the position of the glass to the inside, thereby reducing risks of accidents.

On the wall side, where the window will be framed, a metal stop is placed to fasten the window once maintenance has been finished. This metal stop can move angularly to secure the window.
DESCRIPTION OF THE INVENTION

The purpose of the rotating window assembly is to provide means to rotate windows such that they may turn on a central shaft, in order for the side or sides exposed to the outside the building to be brought towards the inside of the room or safe area, so that the necessary activities of cleaning and/or maintenance of the windows may be carried out.

The rotating window assembly comprises two metal supports, which are parallel to each other and joined to the glass of the window by pressure, consisting of an upper support and a lower support. This provides a strong support so that the window does not become detached, and the supports are secured to the physical part of the wall through a metal frame with a high mechanical efficiency, embedded in the reinforced concrete.

When cleaning the windows, it is no longer necessary to use suspended scaffolding with the risk of accidents or loss of human life.

The metal frame of the glass part of the window has two shafts: an upper shaft and a lower shaft, each one at a distance from the central location or L/2, on which rotation will be carried out. The purpose of this invention is for the window to be able to make a complete rotation, thereby enabling a freedom of movement with no risks to cleaning or maintenance personnel.

In the contacts between the window and the wall, a fastening stop is placed against the glass in such a way so that when the window is being maintained or cleaned, it is impossible for the assembly to move.

The stop has two mobile parts to allow the glass to be both uncoupled and fastened.

DESCRIPTION OF THE DRAWINGS

Figure 1 consists of a general front view of the rotating window assembly. In this drawing, the main points of action are shown, which are the central shaft and the stop in the wall.

Figure 2 represents a top view of the perpendicular and tangential contact point between the stop of the metal fastening structure and window support with the rabbet of the window.

Figure 3 shows the contact stop for perpendicular and tangential fastening within the rabbet. The fasteners can move angularly to allow the release of the glass of the
window (window frame assembly 4).

Figure 4 is a drawing, not to scale, of the upper part of the metal frame that secures the glass to the metal frame. In this drawing, we can see the pivot point on which the window will rotate.

Figure 5 is a drawing of the upper frame of the aforementioned glass. The figure shows a front view, top view (without the central shaft) and a side view of the grip of the glass.

PREFERRED EMBODIMENT OF THE INVENTION

The real dimensions will vary to adjust to the requirements for each case, even for other unconventional models of frames and windows that are either decorative or for protection. The model presents a solution to the need to maintain and clean the exposed areas of the glass, making it possible to rotate the outer sides so that they are facing the inner part.

Figure 1 is a front view of the rotating window assembly, in which its main elements can be seen, where 1 is the contact stop that is perpendicular and tangential to a metal frame - glass assembly 4, and 2 is the upper shaft.

Figure 2 consists of a top view of stop 1 of the wall with the metal frame. Stop 3 secures the metal frame - glass assembly 4 against the rabbet of a window to fasten it to the wall when it is not necessary to rotate it for maintenance. Stop 3 is a device located on the ends of the window and has a high mechanical resistance; which can make angular rotations with respect to the shaft of the glass; which allows for the release of the metal frame - glass assembly 4 so that it can rotate on the upper shaft 2, which requires that stops 3 be release on both sides of the window.

Figure 3 is an enlargement of stop 3. One can see the end points 3a of said stop 3 and the rotation that releases the metal frame - glass assembly 4.

Figure 4 shows the upper shaft 2 on which the metal frame - glass assembly 4 of the window rotates. 2a is a first body of the upper shaft 2 that forms part of the metal structure, embedded in the concrete of the lintel. 2b is a second body of the upper shaft 2, intended to be complementarily linked to the first body 2a, which additionally comprises a bearing to facilitate the rotation of the metal frame - glass assembly 4 on the upper shaft 2.

Figure 5 shows a front view, not to scale, of the metal frame - glass assembly 4 with a high mechanical resistance, as well as top and side views.
CLAIMS

1. A rotating window assembly that comprises:
   - an assembly of a metal frame with a glass window in its interior, which in turn comprises an upper shaft and a lower shaft parallel to the upper shaft,
   - a first rotational shaft fastened perpendicularly to a lintel of a window frame intended to be linked to a midpoint of the upper shaft of the metal frame assembly, and
   - a fastening stop to fasten the metal frame assembly to the window frame.

2. The rotating window assembly according to claim 1, which additionally comprises a second rotational shaft intended to be linked to a midpoint of the lower shaft of the metal frame assembly.

3. The rotating window assembly according to claim 1, in which the upper shaft comprises a first body, embedded in the concrete of the lintel and a second body, intended to be complementarily linked to the first body, which additionally comprises a bearing to facilitate the rotation of the metal frame - glass assembly on the upper shaft.
INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2016/055228

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - E06B 3/40; B60J 1/00; B60J 1/14; E05D 15/48; E06B 1/00; E06B 1/04; E06B 3/26 (2016.01)
CPC - E06B 3/40; B60J 1/00; E05D 1/14; E05Y 2900/148; E06B 1/003; E06B 1/04 (2016.1.1)

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)

IPC - B60J 1/00; B60J 1/14; E05D 15/48; E06B 1/00; E06B 1/04; E06B 3/26; E06B 3/32; E06B 3/36; E06B 3/40
CPC - B60J 1/004; B60J 1/14; E05Y 2900/148; E06B 1/003; E06B 1/04; E06B 3/26; E06B 3/32; E06B 3/36; E06B 3/40

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

USPC - 49/95; 49/139; 49/149; 49/162; 160/210 (keyword delimited)

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

PatBase. GOnDpp Patents, finingla, YOUTUBED
Search terms used: window, frame, metal, glass, shaft, upper, lower, rotational, fastened, parallel, lintel, stop

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category*</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>U3 3,911,023 A (WALIB) 14 October 1985 (14.10.1975) entire document</td>
<td>1-3</td>
</tr>
<tr>
<td>A</td>
<td>US 3,845,585 A (CECIL) 05 November 1974 (05.11.1974) entire document</td>
<td>1-3</td>
</tr>
<tr>
<td>A</td>
<td>US 1,844,427 A (KIRCHOFF) 09 February 1932 (09.02.1932) entire document</td>
<td>1-3</td>
</tr>
</tbody>
</table>

Further documents are listed in the continuation of Box C. 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 application or patent 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

Y 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

"A" member of the same patent family

Date of the actual completion of the international search 21 November 2016

Date of mailing of the international search report 15 DEC 2016

Name and mailing address of the ISA/US
Mail Stop PCT, Attn: ISA/US, Commissioner for Patents
P.O. Box 1450, Alexandria, VA 22313-1450
Facsimile No. 571-273-8300

Authorised officer Blaine R. Copenhaver
PCT Helpdesk: 571-272-4300
PCT OSP: 571-272-7774

Finni PCT/IB2016A/0120 (second filing) (January 2016)