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(11) **EP 0 861 945 A1**

(12) **EUROPEAN PATENT APPLICATION**  
published in accordance with Art. 158(3) EPC

(43) Date of publication:  
**02.09.1998 Bulletin 1998/36**

(21) Application number: **96937973.4**

(22) Date of filing: **08.11.1996**

(51) Int. Cl.<sup>6</sup>: **E02D 27/34, E04H 9/02**

(86) International application number:  
**PCT/CN96/00099**

(87) International publication number:  
**WO 97/18357 (22.05.1997 Gazette 1997/22)**

(84) Designated Contracting States:  
**DE FR GB**

(30) Priority: **16.11.1995 CN 95227035**

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(54) **AN ANTI-SEISMIC BEARING ASSEMBLY BETWEEN BUILDING AND ITS FOUNDATION**

(57) An anti-seismic bearing assembly between building and its foundation includes a sliding pedestal (10), a base support (9) and a cover (5), the sliding pedestal (10) is between the base support (9) and the cover (5) which is fixed to the base support (9) by the bolt (8), a square support plate (2) is welded to the upper end of the sliding pedestal (10), triangle shaped stiffeners (3) are secured between the tube portion of the sliding pedestal (10) and the square plate (2), a rubber layer (4) is around the tube portion of the sliding pedestal (10) at its lower end.

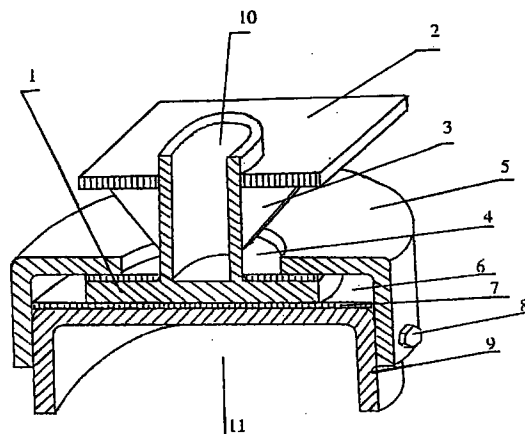


Fig.1

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## Description

### Technical Field

The present invention relates to a vibration isolator for use between building foundation and building (storey body). It should be an earthquake damping device and prevent a building from being destroyed and overturn in an earthquake.

### Background Art

At present high buildings are erected more and more. Insertion of an earthquake damping device for the high buildings is a very important key problem nowadays. There are many kinds of earthquake devices designed all over the world, e. g. vibration isolator with steel ball disk in America, vibration isolator with rubber mounting in Japan etc. The advantage of both kind vibration isolators is to damp the amplitude of vibration for shearing waves in the earthquake. The vibration isolator extends the self-vibrating period of higher buildings having several storeys so that the resonance is not formed with superior periods of earthquake, and the input of earthquake energy into the building is reduced. The disadvantage of both kinds of vibration isolators is as follows: In the case of the steel ball-disk construction, the building will vibrate in the vertical direction when the shearing wave is in up- and -down movement, such action weakens the damping ability of the vibration isolator with the steel ball disk construction in relation to shearing waves. With respect to the vibration isolator with rubber mounting, its advantage is in that the damping effect for shearing waves is smaller. Furthermore, exchange of the rubber mounting after aging is not very convenient.

### Disclosure of Invention

The object of the present invention is to overcome the disadvantage of the vibration isolator referred-to above in the art and to provide a vibration isolator for use between building foundation and building itself or between storeys of the building. Such vibration isolator has a sliding foot sliding in the supporting tray, there is a rubber damping mat around the sliding foot, the isolator is designed with graphite as lubricant. The vibration isolator is convenient in use, and can damp more than 7/8 of the earthquake energy.

The vibration isolator for use between building foundation and building itself consists mainly of a sliding foot, a supporting tray and a cover plate and is characterized in that the sliding foot is inserted between the supporting tray and the cover plate, the cover plate is connected with the supporting tray by bolts, the sliding foot has an extension for carrying a square tray, symmetric triangular bracing plates are fixed between the square tray and the extension.

The vibration isolator is provided with upper and lower sliding layers which are inserted between lower side of sliding foot end or supporting tray and are coated with graphite lubricant; a rubber damping mat is arranged between the sliding foot and the cover plate and a rubber damping mat is arranged between the extension and the cover plate.

Furthermore, the vibration isolator has an extension with a center opening which is welded with reinforcing steel of the building, and the center opening of the supporting tray is welded with reinforcing steel of the building foundation.

### Brief Description of the Drawings

Fig. 1 is a schematic drawing of sectional view of the present invention,

Fig. 2 is a schematic drawing of section of the present invention wherein

- 1 - sliding foot
- 2 - square tray
- 3 - triangular bracing plate
- 4 - rubber damping mat
- 5 - cover plate
- 6 - rubber damping mat
- 7 - upper and lower sliding layer
- 8 - bolt
- 9 - supporting tray
- 10 - extension with center opening
- 11 - center opening of supporting tray.

### Best Mode for Carrying out the Invention

The present invention is further described with reference to the drawings and its embodiment is shown as below:

The vibration isolator for use between building foundation and building itself comprises a sliding foot 1, a supporting tray 9 and a cover plate 5 which are arranged so that the sliding foot 1 is inserted between the supporting tray 9 and the cover plate 5. The cover plate 5 is connected with the supporting tray 9 by bolts 8. The sliding foot 1 has an extension 10 with a center opening in it. The upper end of the extension has a square tray 2 fixed by welding. Symmetric triangular bracing plates 3 are fixed between the square tray 2 and the extension 10 of the sliding foot 1. There are upper and lower sliding layers 7 inserted between upper and lower side of the sliding foot 1 on the one hand and cover plate 5 or supporting tray 9 on the other hand. These layers 7 are coated with graphite lubricant. A rubber damping mat 6 is fixed between the sliding foot 1 and the cover plate 5; furthermore, a rubber damping mat 4 is fixed between the extension 10 and the cover plate 5. The extension 10 is welded with the reinforcing steel of the building. The lower part 11 of the supporting tray 9 is welded with the reinforcing steel of the building

foundation. When in use, the vibration isolator is placed on the building foundation, the opening of lower part of the vibration isolator is welded with the reinforcing steel of the foundation, the opening of extension 10 is welded with the reinforcing steel of the building. The steel is then filled with concrete. The vibration isolator can damp more than 7/8 of earthquake energy under test.

## Claims

1. A vibration isolator for use between building foundation and the building itself or between storeys comprising a sliding foot (1), a supporting tray (9) and a cover plate (5),  
characterized in that the sliding foot (1) is inserted between the supporting tray (9) and the cover plate (5); the cover plate (5) is connected with the supporting tray (5) by bolts, the sliding foot (1) has an extension (10) for carrying a square tray (2), symmetric triangular bracing plates (3) are fixed between the square tray (2) and the extension (10).
2. The vibration isolator according to claim 1, characterized in that upper and lower sliding layers (7) are inserted between lower side of sliding foot (1) and cover plate (5) or supporting tray (9) and are coated with graphite lubricant; a rubber damping mat (6) is arranged between the sliding foot (1) and the cover plate (5) and in that a rubber damping mat (4) is arranged between the extension (10) and the cover plate (5).
3. The vibration isolator of claim 1 or 2, characterized in that the extension (10) has a center opening which is welded with reinforcing steel of the building and in that a center opening (11) of the supporting tray (9) is welded with reinforcing steel of the building foundation.

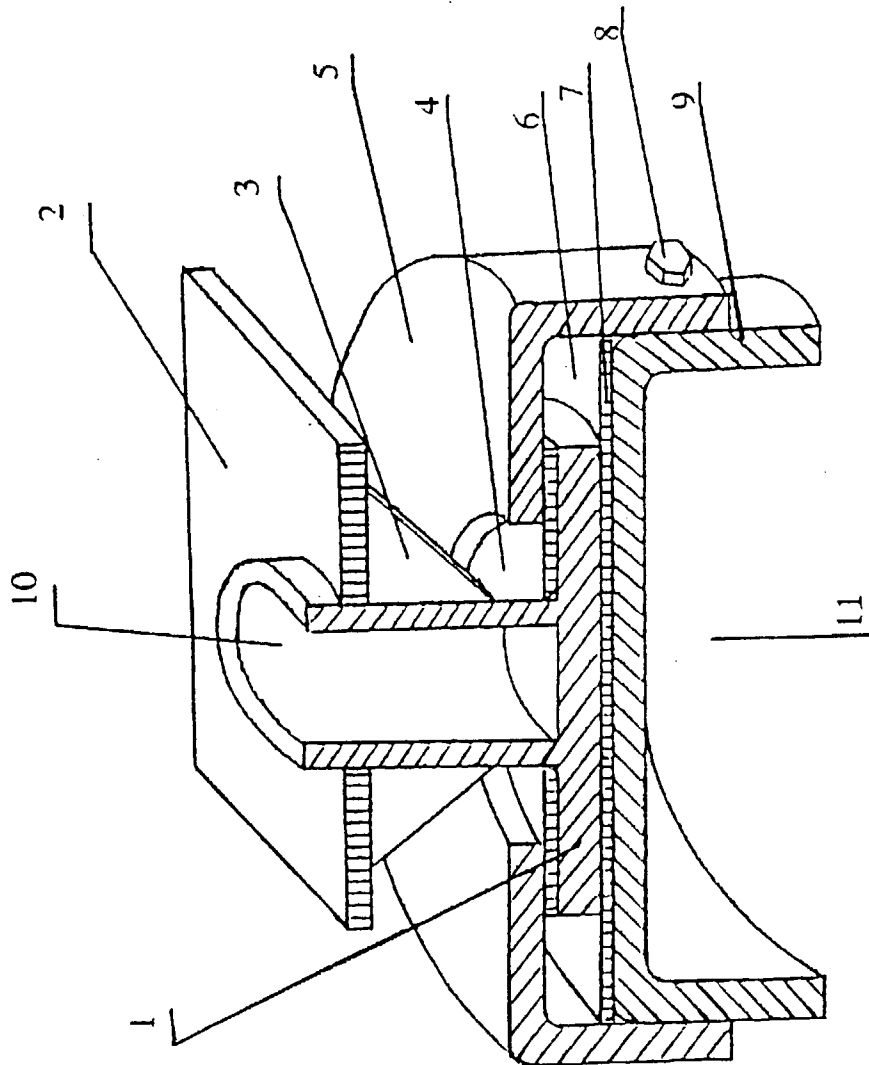


Fig. 1

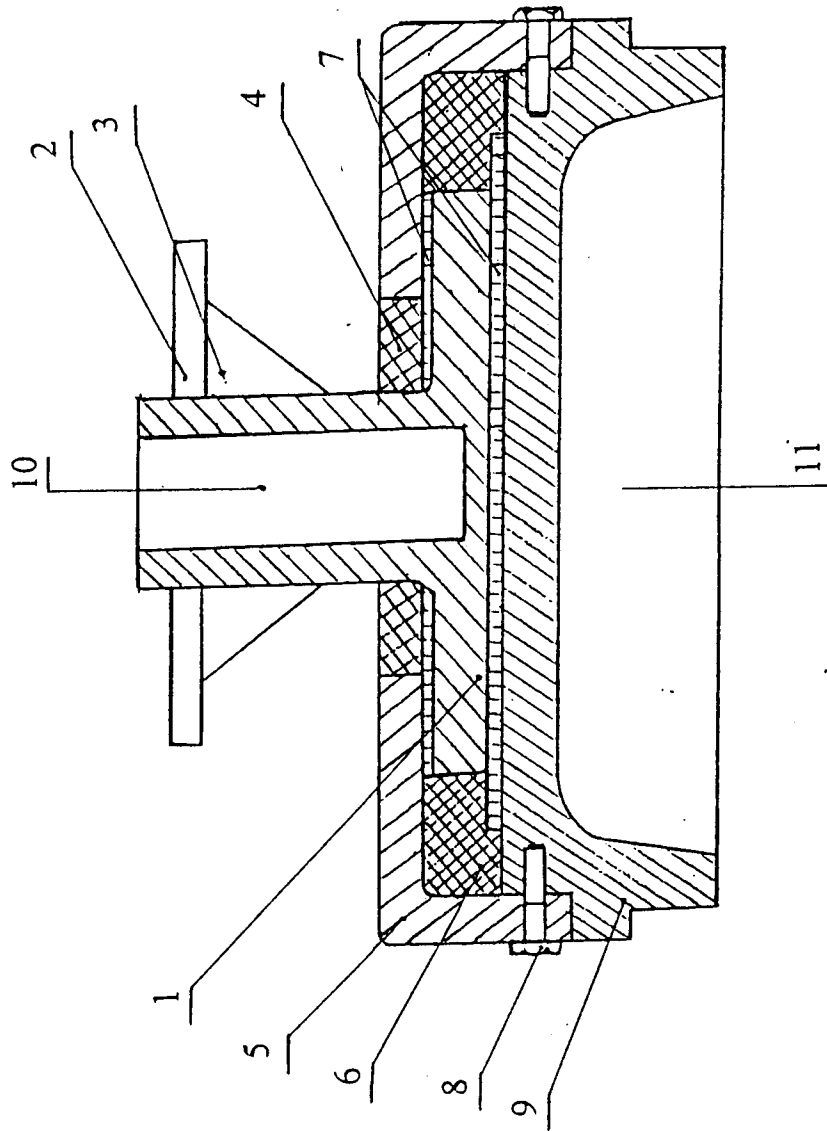


Fig.2

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN/96/00099

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC <sup>6</sup> E02D27/34, E04H9/02 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) IPC <sup>6</sup> E02D27/00 , 27/32 , 27/34 , E04H9/00 , 9/02 Documentation searched other than minimum documentation to the extent that such documents are included in the field searched Chinese patent document ( 1985 ~ ) 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 claim No.
A	US,A,4328648 ( Alesandrs K.kalpins ) 11 May 1982 ( 11.05.82 ) column 3 , line 64 ~ column 10 , line 10 ; figures1 ~ 25	1
A	SU,A,1761929 ( Pensa civil engineering institute )15 September 1992 (15.09.92 ) the whole document ; figure 2	1
A	US,A,4633628 ( University of Utah ) 6 January 1987 ( 06.01.87 ) column 2 , line 31 ~ column 4 , line 41 ; figures 1 ~ 10	1
A	SU,A,1604937 ( Lengd rail transportion ) 7 November 1990 ( 07.11.90 ) the whole document ; figure 2	1
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
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Date of the actual completion of the international search 14 January 1997 ( 14.01.97 )		Date of mailing of the international search report 23 JAN 1997 (23.01.97)
Name and mailing address of the ISA/ The Chinese Patent Office 6, Xitucheng Road, Haidian District, Beijing, 100088, China Facsimile No. 86-10-62019451		Authorized officer Huang Fei Telephone No. 86-10-62093944

Form PCT/ISA/210(second sheet)(July 1992)