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(54) **ELEVATOR COUNTERWEIGHT WITH BUFFER**

AUFZUGGEGENGEWICHT MIT PUFFER

CONTREPOIDS POUR ASCENSEUR COMPRENANT UN AMORTISSEUR

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Description

1. Field of the Invention

[0001] This invention generally relates to elevator systems. More particularly, this invention relates to an elevator counterweight having a buffer supported on the counterweight.

2. Description of the Related Art

[0002] Elevator systems often include an elevator car and counterweight coupled together by a rope so that the two move together within a hoistway, for example. It is common practice to provide a buffer in a pit to absorb impact with the counterweight in the event that the counterweight drops to a lowest possible position where the counterweight contacts the buffer. The position of the buffer typically dictates the range of motion of the counterweight in a downward direction, which corresponds to a range of motion for the elevator car in an upward direction.

[0003] JP 7-330253 discloses a counterweight for an elevator that is capable of easily adjusting the size of the minimum gap between a buffer provided in the lowermost end of the lift path and the counterweight.

[0004] Under some circumstances, low overhead clearance above an elevator car may be a concern. With such arrangements, there is more limited overhead clearance between the top of an elevator car assembly and a stationary structure such as hoistway ceiling or a machine support within an elevator hoistway, for example, when the counterweight is in a lowest possible position.

[0005] During an inspection or maintenance procedure, for example, it is important to maintain adequate overhead clearance above an elevator car to allow an individual to be on top of the car during an inspection or maintenance procedure without risking an undesirable collision with the overhead structure in the hoistway. It is desirable to address such situations without introducing additional costs and still maintain the space savings associated with machine roomless elevator systems, for example.

[0006] There is a need for an efficient arrangement for providing sufficient overhead clearance above an elevator car under appropriate circumstances. This invention addresses that need.

[0007] The present invention provides a counterweight as defined by claim 1.

[0008] A counterweight for use in an elevator system includes a frame that defines an outer edge of at least one side of the counterweight. A buffer member is supported by the frame and moveable between a first position where a first fixed length of the buffer member extends beyond the outer edge and a second position where a second, shorter fixed length of the buffer member extends beyond the outer edge.

[0009] A locking member selectively locks the buffer member in the first and second positions, respectively. A controller activates the locking member responsive to an elevator system operation condition for appropriately controlling the position of the buffer member relative to the frame.

[0010] One example includes a receiver portion of the counterweight frame that at least partially receives the buffer member. The buffer member is moveable within the receiver portion such that a first length of the buffer member is received in the receiver portion when the buffer member is in the first position. A second, greater length of the buffer member is received in the receiver portion in the second position. In this example, the buffer member is effectively retractable into the counterweight.

[0011] An example elevator system includes an elevator car supported for vertical movement. A counterweight is associated with the elevator car such that the counterweight moves when the elevator car moves. A buffer member is supported on the counterweight for movement with the counterweight. The buffer member has a first fixed position relative to the counterweight that allows a first range of movement of the elevator car. The buffer member has a second fixed position relative to the counterweight that allows a second, greater range of movement of the elevator car.

[0012] One example includes a controller that maintains the buffer member in a selected one of the first or second positions responsive to an elevator system operation condition. In one example, the controller maintains the buffer in the first position when the elevator system is in an inspection mode.

[0013] In one example, the counterweight is moveable in a direction toward a structure so that the buffer member contacts the structure to cause the buffer member to move into the second position.

[0014] The various features and advantages of this invention will become apparent to those skilled in the art from the following detailed description. The drawings that accompany the detailed description can be briefly described as follows.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015]

Figure 1 schematically illustrates selected portions of an elevator system.

Figure 2 schematically illustrates an example counterweight designed according to an embodiment of this invention including a buffer member in one operating position.

Figure 3 schematically illustrates the embodiment of Figure 2 with the buffer member in another operating position.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0016] Figure 1 schematically shows an elevator system 20 that includes an elevator car and a counterweight 24 that are coupled by a load bearing assembly 26. The example arrangement includes sheaves 28 over which the load bearing assembly 26 travels to cause movement of the elevator car 22 between different levels in a building as desired in a known manner. A controller 30 controls movement of the elevator car 22 and the counterweight 24.

[0017] An example counterweight 24 is schematically shown in Figure 2. The counterweight 24 includes a structure 32 that has at least one outer edge 34, which defines a lower edge of the counterweight 24 in the illustration. The example structure 32 comprises a frame that supports a plurality of plates 36 in a known manner to establish the desired mass of the counterweight 24.

[0018] A receiver portion 38 is supported by the structure 32. In one example, the receiver portion 38 is generally cylindrical and hollow.

[0019] A buffer member 40 is at least partially received within the receiver portion 38 such that the buffer member 40 is supported by the structure 32 for movement with the counterweight 24. The example buffer member 40 includes a fixed length body 42. In this example, a cushion member 44 is located near one end of the body 42. One example cushion member 44 comprises a spring. Another example cushion member 44 comprises elastomeric material.

[0020] A stop portion 46 is located near an opposite end of the body 42. The stop portion 46 controls the amount of movement of the buffer member 40 relative to the receiver portion 38. In the position shown in Figure 2, the stop member 46 encounters a stop surface 50 when the buffer member 40 is in a fully retracted position within the receiver portion 38.

[0021] In the position of Figure 2, locking members 52 have moveable portions 54 and maintain the buffer member 40 in the illustrated, retracted position. In this example, the body 42 includes positioning portions 56 and 58 that cooperate with the locking members 52 to maintain the buffer member 40 in a selected position relative to the counterweight 24. In this example, the moveable portions 54 are received within recesses 56 or 58 depending on the position of the buffer member 40 relative to the counterweight 24.

[0022] The moveable portions 54 have a sufficient strength to withstand any impact between the buffer member 40 and a structure beneath the counterweight 24 during movement of the counterweight 24 and still maintain the buffer member 40 in a desired position. In one example, the moveable portions are designed to withstand an impact associated with the counterweight 24 moving at a speed up to the tripping speed of a governor that operates in a known manner.

[0023] The retracted position of the buffer member 40 shown in Figure 2 corresponds to a normal elevator system operating position. During normal elevator system operation, a maximum range of motion of the elevator car 22 and the counterweight 24 are desirable. Maintaining the buffer member 40 in a retracted position allows the outer edge 34 of the counterweight 24 to approach a structure at a lower end of a hoistway, such as within a pit. The lowermost position in the example of Figure 2 corresponds to the cushion member 44 contacting an appropriately positioned structure near the bottom of a hoistway. The lower that the counterweight 24 is able to travel, the higher that the elevator car 22 is able to travel.

[0024] Under elevator system operating conditions where it is desirable to maintain a specified overhead clearance above the elevator car 22, the buffer member 40 is moveable into an extended position as shown in Figure 3. In the illustrated example, a controller 60 controls the locking members 52 to selectively release the body 42 to move between the retracted position shown in Figure 2 and the extended position shown in Figure 3. In one example, a top of car inspection box may be used to signal the controller 30 regarding a desired operation of the locking members 52.

[0025] In one example, the locking members 52 comprise electromechanical devices such as solenoids. The controller 60 controls operation of those devices to retract the moveable portions 54 so that they are clear of the recesses 56 when it is desirable to allow the buffer member 40 to move into the extended position of Figure 3. In one example, the weight of the body 42 causes the buffer member 40 to effectively fall into the extended position. The stop portion 46 on the body 42 cooperates with a support surface 62 of the receiver portion 38 to limit the amount of movement of the buffer member 40 into the extended position. The controller 60 then operates the locking members 52 until the moveable portions 54 are received in the recesses 58. This locks the buffer member 40 into the extended position shown in Figure 2.

[0026] The extended position shown in Figure 3 is useful during inspection procedures, for example, because the fixed length of the body 42 extending beyond the outer edge 34 provides for a more limited range of motion of the counterweight 24. The counterweight 24 is not able to travel to as low a position as was possible when the buffer member 40 was in the position shown in Figure 2. Accordingly, the elevator car 22 is not permitted to travel to as high a position when the buffer member 40 is in the extended position shown in Figure 3. This provides for maintaining a desired amount of overhead clearance between the elevator car 22 and an overhead structure such as a machine support.

[0027] In one example, the controller 60 operates the locking members 52 to allow the buffer member 40 to move into the extended position of Figure 3 whenever the elevator system is placed into an inspection mode. There are known techniques for placing an elevator system into inspection mode and those skilled in the art who have the benefit of this description will realize how to

configure a controller or the locking members 52 to operate responsive to an elevator system entering an inspection mode. In one example, whenever a hoistway access is open, the controller 60 responds by controlling the locking members 52 to allow the buffer member 40 to assume an extended position as schematically shown in Figure 3.

[0028] In one example, the controller 60 is a portion of the elevator system controller 30. In another example, the controller 60 is a separate, dedicated controller.

[0029] In another example, the locking members 52 can be manually controlled for selectively locking the buffer member 40 into a desired position relative to the counterweight 24.

[0030] Once an inspection or maintenance procedure has been completed or it is otherwise desirable to move the buffer member 40 from the extended position of Figure 3 into the retracted position of Figure 2, the counterweight 24 can be allowed to move downward (according to the drawings) until the buffer member 40 contacts a structure that effectively pushes the buffer member 40 upward relative to the downwardly moving counterweight 24. In one example, the hoistway pit includes a structure that contacts the cushion 44.

[0031] In one example, the controller 30 automatically moves the elevator car 22 and counterweight 24 in a manner to facilitate moving the buffer member 40 into the retracted position by lowering the counterweight 24. In another example, a mechanic or technician manually causes movement of the elevator system components so that the buffer member 40 is effectively pushed into the retracted position as the counterweight 24 approaches a structure near the bottom of the hoistway, for example.

[0032] Supporting a buffer member for movement with an elevator counterweight and allowing the buffer member to be selectively fixed in a position relative to the counterweight, allows for controlling the range of motion of elevator system components. The disclosed example provides cost saving and space saving advantages compared to arrangements where a buffer is maintained in a hoistway pit. With the disclosed example, there is less need for space and materials in a pit. Additionally, there is a savings in labor costs as no buffer need be installed on site in the pit.

[0033] The preceding description is exemplary rather than limiting in nature. Variations and modifications to the disclosed examples may become apparent to those skilled in the art that do not necessarily depart from the essence of this invention. The scope of legal protection given to this invention can only be determined by studying the following claims.

Claims

1. A counterweight (24) for use in an elevator system, comprising:

a buffer member (40) that is moveable between a first position where a first fixed length of the buffer member extends beyond an outer edge of the counterweight and a second position where a second, shorter fixed length of the buffer member extends beyond the outer edge; and

characterised by comprising:

a locking member (52) that selectively locks the buffer member in the first and second positions, respectively, wherein the locking member (52) comprises an electromechanical device having a moving portion (54) that selectively moves into a locking position for locking the buffer member in a selected one of the positions.

2. The counterweight of claim 1, wherein a portion of the buffer member (40) is retracted inward toward a center of the counterweight in the second position.

3. The counterweight of claim 1, wherein the buffer member (40) has a first end and a second end and a fixed length between the first and second ends.

4. The counterweight of claim 1, including a controller (60) that activates the locking member (52) responsive to an elevator system operation condition.

5. The counterweight of claim 1, wherein the buffer member (40) includes a positioning portion that cooperates with the locking member for maintaining the buffer member in a selected one of the first or second positions.

6. The counterweight of claim 5, wherein the positioning portion comprises at least one recess in a portion of the buffer member positioned near the locking member when the buffer member is in the second position.

7. The counterweight of claim 6, including at least one other recess in another portion of the buffer member positioned near the locking member when the buffer member is in the first position.

8. The counterweight of claim 1, wherein the counterweight (24) comprises a structure and the buffer member is moveable within a receiver portion associated with the structure, a first length of the buffer member being received in the receiver portion in the first position and a second, greater length of the buffer member being received in the receiver portion in the second position.

9. The counterweight of claim 8, wherein the buffer member (40) has one end received within the receiver portion that includes a stop and the receiver por-

tion includes a support surface that cooperates with the stop to maintain the buffer member at least partially within the receiver portion.

10. The counterweight of claim 9, wherein the buffer member (40) has a fixed length.

11. An elevator system comprising:

an elevator car (22) supported for vertical movement within a hoistway;
a counterweight (24) associated with the elevator car such that the counterweight moves when the elevator car moves;
a buffer member (40) supported on the counterweight (24) for movements with the counterweight, the buffer member having a first fixed position relative to the counterweight that allows a first range of movement of the elevator car for maintaining a first clearance between the elevator car and a surface of the hoistway and a second fixed position relative to the counterweight that allows a second, greater range of movement of the elevator car for maintaining a second, smaller clearance between the elevator car and the surface of the hoistway; and
a controller (30,60) that controls movement of the elevator car and the counterweight and selectively causes the counterweight to move in a manner to move the buffer member (40) from the first position to the second position.

12. The elevator system of claim 11, wherein the controller (30,60) maintains the buffer member (40) in a selected one of the first or second positions responsive to an elevator system operation condition.

13. The elevator system of claim 12, wherein the controller (30,60) maintains the buffer in the first position when the elevator system is in an inspection mode.

14. The elevator system of claim 11, including a locking member (52) that locks the buffer member (40) in a selected one of the first or second positions.

15. The elevator system of claim 14, wherein the buffer member (40) includes at least one recess that receives a portion of the locking member for maintaining the buffer member in the selected position.

16. The elevator system of claim 11, wherein the first position includes at least a portion of the buffer member extending away from the counterweight and the controller causes the car or the counterweight to move in a direction toward a structure so that the buffer member contacts the structure to cause the buffer member to move into the second position.

17. A method of controlling a range of movement of an elevator car (22) that is associated with a counterweight (24) that moves when the elevator car (22) moves, the counterweight (24) having a buffer member (40) supported on the counterweight (24), comprising the steps of:

placing the buffer member (40) in a first position where at least a portion of the buffer member extends away from the counterweight (24) to allow a first range of motion of the elevator car (22) for maintaining a first clearance between the elevator car and a surface of a hoistway;
placing the buffer member (40) in a second, retracted position relative to the counterweight (24) to allow a second, greater range of motion of the elevator car (22) for maintaining a second, smaller clearance between the elevator car and the surface; and
controlling movement of the elevator car (22) and the counterweight (24) and selectively causing the counterweight (24) to move in a manner to move the buffer member (40) from the first position to the second position.

Patentansprüche

1. Gegengewicht (24) zur Verwendung in einem Aufzugsystem, das Folgendes umfasst:

ein Pufferelement (40), das zwischen einer ersten Position, in der sich eine erste feste Länge des Pufferelements über eine Außenkante des Gegengewichts hinaus erstreckt, und einer zweiten Position, in der sich eine zweite, kürzere feste Länge des Pufferelements über die Außenkante hinaus erstreckt, beweglich ist; und

dadurch gekennzeichnet, dass es Folgendes umfasst:

ein Verriegelungselement (52), das das Pufferelement selektiv in der ersten bzw. der zweiten Position verriegelt, wobei das Verriegelungselement (52) eine elektromechanische Vorrichtung mit einem Bewegungsabschnitt (54) umfasst, der sich zum Verriegeln des Pufferelements in einer ausgewählten der Positionen selektiv in eine Verriegelungsposition bewegt.

2. Gegengewicht nach Anspruch 1, wobei ein Abschnitt des Pufferelements (40) in der zweiten Position in Richtung einer Mitte des Gegengewichts nach innen zurückgezogen ist.

3. Gegengewicht nach Anspruch 1, wobei das Pufferelement (40) ein erstes Ende und ein zweites Ende

und eine feste Länge zwischen dem ersten und dem zweiten Ende aufweist.

4. Gegengewicht nach Anspruch 1 mit einer Steuereinheit (60), die das Verriegelungselement (52) in Reaktion auf eine Aufzugsystem-Betriebsbedingung aktiviert.

5. Gegengewicht nach Anspruch 1, wobei das Pufferelement (40) einen Positionierungsabschnitt umfasst, der zum Halten des Pufferelements in einer ausgewählten der ersten oder der zweiten Position mit dem Verriegelungselement zusammenwirkt.

6. Gegengewicht nach Anspruch 5, wobei der Positionierungsabschnitt mindestens eine Aussparung in einem Abschnitt des Pufferelements umfasst, die nahe dem Verriegelungselement angeordnet ist, wenn sich das Pufferelement in der zweiten Position befindet.

7. Gegengewicht nach Anspruch 6 mit mindestens einer weiteren Aussparung in einem weiteren Abschnitt des Pufferelements, die nahe dem Verriegelungselement angeordnet ist, wenn sich das Pufferelement in der ersten Position befindet.

8. Gegengewicht nach Anspruch 1, wobei das Gegengewicht (24) eine Struktur umfasst und das Pufferelement innerhalb eines Aufnahmeabschnitts beweglich ist, der der Struktur zugeordnet ist, wobei in der ersten Position eine erste Länge des Pufferelements im Aufnahmeabschnitt aufgenommen wird, und in der zweiten Position eine zweite, größere Länge des Pufferelements im Aufnahmeabschnitt aufgenommen wird.

9. Gegengewicht nach Anspruch 8, wobei das Pufferelement (40) ein Ende aufweist, das im Aufnahmeabschnitt aufgenommen wird und das einen Anschlag umfasst, und der Aufnahmeabschnitt eine Stützfläche umfasst, die mit dem Anschlag zusammenwirkt, um das Pufferelement zumindest teilweise im Aufnahmeabschnitt zu halten.

10. Gegengewicht nach Anspruch 9, wobei das Pufferelement (40) eine feste Länge aufweist.

11. Aufzugsystem, das Folgendes umfasst:

eine Aufzugkabine (22), die für eine vertikale Bewegung innerhalb eines Aufzugsschachts getragen wird;
ein Gegengewicht (24), das der Aufzugkabine zugeordnet ist, so dass sich das Gegengewicht bewegt, wenn sich die Aufzugkabine bewegt;
ein Pufferelement (40), das am Gegengewicht (24) zur Bewegung mit dem Gegengewicht getragen wird, wobei das Pufferelement eine erste feste Position relativ zum Gegengewicht, die einen ersten Bewegungsbereich der Aufzugkabine zum Aufrechterhalten eines ersten Zwischenraums zwischen der Aufzugkabine und einer Oberfläche des Aufzugsschachts ermöglicht, und eine zweite feste Position relativ zum Gegengewicht, die einen zweiten, größeren Bewegungsbereich der Aufzugkabine zum Aufrechterhalten eines zweiten, kleineren Zwischenraums zwischen der Aufzugkabine und der Oberfläche des Aufzugsschachts ermöglicht, aufweist; und
eine Steuereinheit (30, 60), die die Bewegung der Aufzugkabine und des Gegengewichts steuert und selektiv bewirkt, dass sich das Gegengewicht in einer Weise bewegt, um das Pufferelement (40) von der ersten Position in die zweite Position zu bewegen.

12. Aufzugsystem nach Anspruch 11, wobei die Steuereinheit (30, 60) das Pufferelement (40) in einer ausgewählten der ersten oder der zweiten Position in Reaktion auf eine Aufzugsystem-Betriebsbedingung hält.

13. Aufzugsystem nach Anspruch 12, wobei die Steuereinheit (30, 60) den Puffer in der ersten Position hält, wenn sich das Aufzugsystem in einem Inspektionsmodus befindet.

14. Aufzugsystem nach Anspruch 11 mit einem Verriegelungselement (52), das das Pufferelement (40) in einer ausgewählten der ersten oder der zweiten Position verriegelt.

15. Aufzugsystem nach Anspruch 14, wobei das Pufferelement (40) mindestens eine Aussparung umfasst, die einen Abschnitt des Verriegelungselements aufnimmt, um das Pufferelement in der ausgewählten Position zu halten.

16. Aufzugsystem nach Anspruch 11, wobei die erste Position umfasst, dass sich zumindest ein Abschnitt des Pufferelements vom Gegengewicht weg erstreckt, und die Steuereinheit bewirkt, dass sich die Kabine oder das Gegengewicht in einer Richtung zu einer Struktur hin bewegt, so dass das Pufferelement mit der Struktur in Kontakt kommt, um zu bewirken, dass sich das Pufferelement in die zweite Position bewegt.

17. Verfahren zum Steuern eines Bewegungsbereichs einer Aufzugkabine (22), die einem Gegengewicht (24) zugeordnet ist, das sich bewegt, wenn sich die Aufzugkabine (22) bewegt, wobei das Gegengewicht (24) ein Pufferelement (40) aufweist, das am Gegengewicht (24) abgestützt ist, mit den folgenden

Schritten:

Anordnen des Pufferelements (40) in einer ersten Position, in der sich zumindest ein Abschnitt des Pufferelements vom Gegengewicht (24) weg erstreckt, um einen ersten Bewegungsbereich der Aufzugkabine (22) zum Aufrechterhalten eines ersten Zwischenraums zwischen der Aufzugkabine und einer Oberfläche eines Aufzugsschachts zu ermöglichen;
Anordnen des Pufferelements (40) in einer zweiten, zurückgezogenen Position relativ zum Gegengewicht (24), um einen zweiten, größeren Bewegungsbereich der Aufzugkabine (22) zum Aufrechterhalten eines zweiten, kleineren Zwischenraums zwischen der Aufzugkabine und der Oberfläche zu ermöglichen; und
Steuern der Bewegung der Aufzugkabine (22) und des Gegengewichts (24) und selektives Bewirken, dass sich das Gegengewicht (24) in einer Weise bewegt, um das Pufferelement (40) von der ersten Position in die zweite Position zu bewegen.

Revendications

1. Contrepoids (24) destiné à être utilisé dans un système ascenseur, comprenant :

un élément amortisseur de choc (40) qui peut être déplacé entre une première position dans laquelle une première longueur fixe de l'élément amortisseur de choc s'étend au-delà d'un bord extérieur du contrepoids et une deuxième position dans laquelle une deuxième longueur fixe plus courte de l'élément amortisseur de choc s'étend au-delà du bord extérieur ; et

caractérisé en ce qu'il comprend :

un élément de verrouillage (52) qui verrouille sélectivement l'élément amortisseur de choc dans la première et la deuxième position, respectivement, cet élément de verrouillage (52) comprenant un dispositif électromécanique ayant une partie mobile (54) qui se déplace sélectivement dans une position de verrouillage pour verrouiller l'élément amortisseur de choc dans une position sélectionnée parmi les positions.

2. Contrepoids selon la revendication 1, dans lequel une partie de l'élément amortisseur de choc (40) est rentrée vers l'intérieur vers un centre du contrepoids dans la deuxième position.

3. Contrepoids selon la revendication 1, dans lequel l'élément amortisseur de choc (40) a une première extrémité et une deuxième extrémité et une longueur fixe entre la première et la deuxième extrémité.

4. Contrepoids selon la revendication 1, comprenant un dispositif de commande (60) qui active l'élément de verrouillage (52) en réponse à une condition de fonctionnement du système ascenseur.

5. Contrepoids selon la revendication 1, dans lequel l'élément amortisseur de choc (40) comprend une partie de positionnement qui coopère avec l'élément de verrouillage pour maintenir l'élément amortisseur de choc dans une position sélectionnée parmi la première et la deuxième position.

6. Contrepoids selon la revendication 5, dans lequel la partie de positionnement comprend au moins un évidement dans une partie de l'élément amortisseur de choc, positionné près de l'élément de verrouillage lorsque l'élément amortisseur de choc est dans la deuxième position.

7. Contrepoids selon la revendication 6, comprenant au moins un autre évidement dans une autre partie de l'élément amortisseur de choc, positionné près de l'élément de verrouillage lorsque l'élément amortisseur de choc est dans la première position.

8. Contrepoids selon la revendication 1, ce contrepoids (24) comprenant une structure et l'élément amortisseur de choc pouvant être déplacé à l'intérieur d'une partie de réception associée à cette structure, une première longueur de l'élément amortisseur de choc étant reçue dans la partie de réception dans la première position et une deuxième longueur plus grande de l'élément amortisseur de choc étant reçue dans la partie de réception dans la deuxième position.

9. Contrepoids selon la revendication 8, dans lequel l'élément amortisseur de choc (40) a une extrémité reçue à l'intérieur de la partie de réception qui comprend une butée et la partie de réception comprend une surface de support qui coopère avec la butée pour maintenir l'élément amortisseur de choc au moins partiellement à l'intérieur de la partie de réception.

10. Contrepoids selon la revendication 9, dans lequel l'élément amortisseur de choc (40) a une longueur fixe.

11. Système ascenseur comprenant :

une cabine d'ascenseur (22) supportée pour le déplacement vertical à l'intérieur d'un puits ;
un contrepoids (24) associé à la cabine d'ascenseur de manière à ce que le contrepoids se dé-

place quand la cabine d'ascenseur se déplace ;
un élément amortisseur de choc (40) supporté sur le contrepoids (24) pour se déplacer avec le contrepoids, cet élément amortisseur de choc ayant une première position fixe par rapport au contrepoids qui permet une première amplitude de déplacement de la cabine d'ascenseur pour maintenir un premier espace libre entre la cabine d'ascenseur et une surface du puits et une deuxième position fixe par rapport au contrepoids qui permet une deuxième amplitude plus grande de déplacement de la cabine d'ascenseur pour maintenir un deuxième espace libre plus petit entre la cabine d'ascenseur et la surface du puits ; et
un dispositif de commande (30, 60) qui commande le déplacement de la cabine d'ascenseur et du contrepoids et qui cause sélectivement le déplacement du contrepoids d'une façon qui déplace l'élément amortisseur de choc (40) de la première position dans la deuxième position.

12. Système ascenseur selon la revendication 11, dans lequel le dispositif de commande (30, 60) maintient l'élément amortisseur de choc (40) dans une position sélectionnée parmi la première et la deuxième position en réponse à une condition de fonctionnement du système ascenseur.

13. Système ascenseur selon la revendication 12, dans lequel le dispositif de commande (30, 60) maintient l'élément amortisseur de choc dans la première position lorsque le système ascenseur est dans un mode d'inspection.

14. Système ascenseur selon la revendication 11, comprenant un élément de verrouillage (52) qui verrouille l'élément amortisseur de choc (40) dans une position sélectionnée parmi la première et la deuxième position.

15. Système ascenseur selon la revendication 14, dans lequel l'élément amortisseur de choc (40) comprend au moins un évidement qui reçoit une partie de l'élément de verrouillage pour maintenir l'élément amortisseur de choc dans la position sélectionnée.

16. Système ascenseur selon la revendication 11, dans lequel la première position comprend au moins une partie de l'élément amortisseur de choc qui s'étend dans une direction opposée au contrepoids et dans lequel le dispositif de commande fait en sorte que la cabine ou le contrepoids se déplacent dans une direction vers une structure de manière à ce que l'élément amortisseur de choc entre en contact avec la structure pour faire en sorte que l'élément amortisseur de choc se mette dans la deuxième position.

17. Procédé de commande d'une amplitude de déplacement d'une cabine d'ascenseur (22) qui est associée à un contrepoids (24) qui se déplace lorsque la cabine d'ascenseur (22) se déplace, ce contrepoids (24) ayant un élément amortisseur de choc (40) supporté sur le contrepoids (24), comprenant les étapes consistant à :

placer l'élément amortisseur de choc (40) dans une première position dans laquelle au moins une partie de l'élément amortisseur de choc s'étend dans une direction opposée au contrepoids (24) pour permettre une première amplitude de déplacement de la cabine d'ascenseur (22) afin de maintenir un premier espace libre entre la cabine d'ascenseur et une surface d'un puits ;
placer l'élément amortisseur de choc (40) dans une deuxième position rentrée par rapport au contrepoids (24) pour permettre une deuxième amplitude plus grande de déplacement de la cabine d'ascenseur (22) afin de maintenir un deuxième espace libre plus petit entre la cabine d'ascenseur et la surface ; et à
commander le déplacement de la cabine d'ascenseur (22) et du contrepoids (24) et à causer sélectivement le déplacement du contrepoids (24) d'une façon qui déplace l'élément amortisseur de choc (40) de la première position dans la deuxième position.

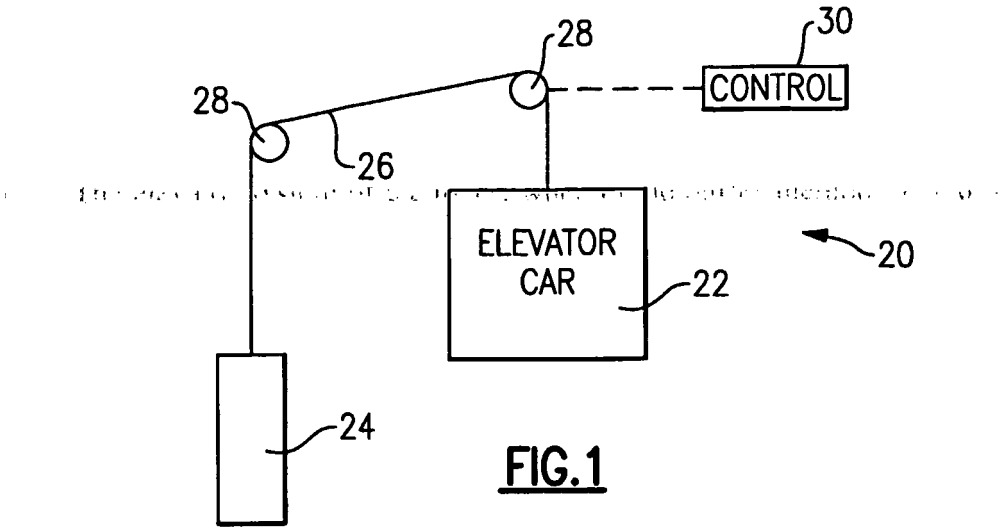

28
30
CONTROL
28
26
ELEVATOR
CAR
22
20
24

FIG.1

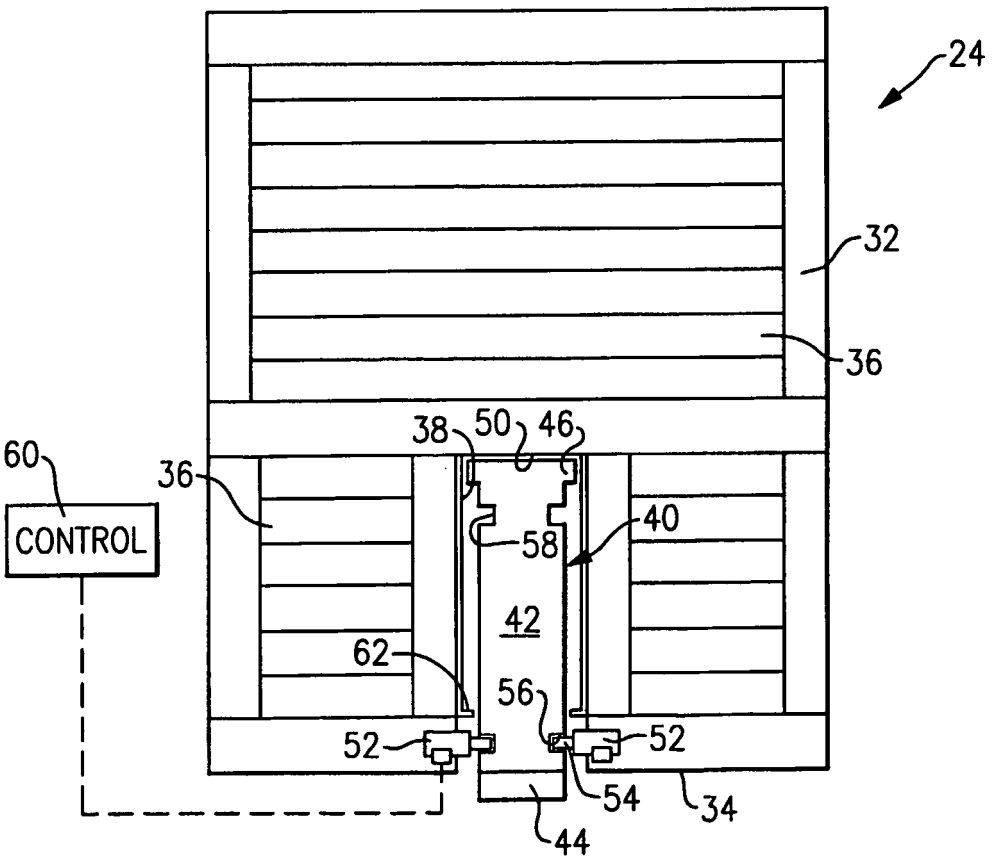

24
32
36
38
50
46
60
36
CONTROL
40
58
42
62
56
52
52
54
34
44

FIG.2

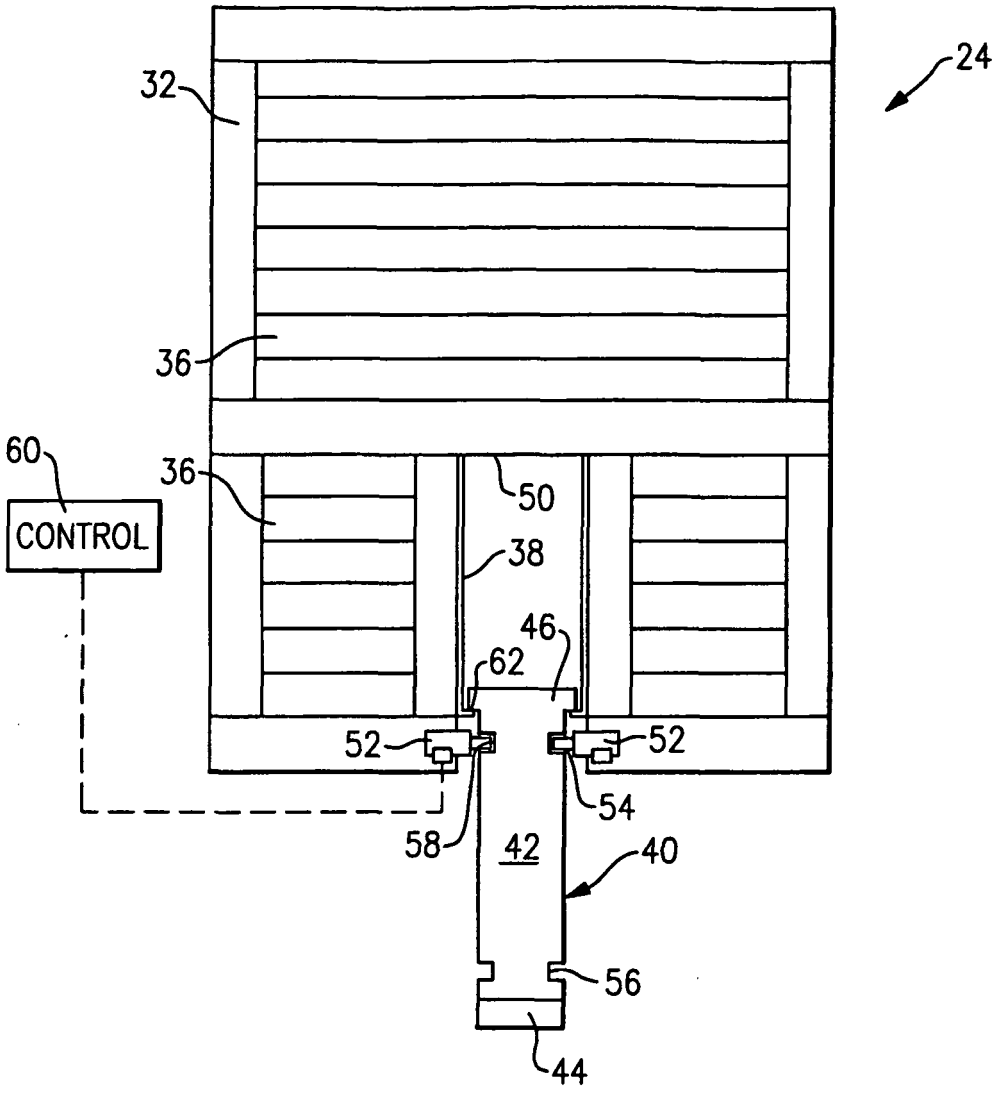


FIG.3

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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