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(54) **COMBINED ELEVATOR GUIDING AND SAFETY BRAKING DEVICE**

KOMBINIERTE AUFZUGSFÜHRUNGS- UND SICHERHEITSBREMSVORRICHTUNG

DISPOSITIF COMBINE DE GUIDAGE ET DE FREINAGE DE SECURITE D'ASCENSEUR

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(56) References cited:
GB-A- 400 157 **US-A- 5 224 570**
US-A- 5 377 786 **US-A- 6 092 630**
US-B1- 6 176 350

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Description

Technical Field

[0001] This invention generally relates to elevator systems. More particularly, this invention relates to a combined guiding and braking device for use in an elevator system.

The Prior Art

[0002] GB-A-400157 discloses a car guiding and braking device in an elevator system.

[0003] Elevator systems typically include a car that moves within a hoistway between different levels in a building. Guide rails within the hoistway provide structure for guiding movement of the car as needed. Typical systems include guide rollers or guide shoes that ride along surfaces on the guide rails to facilitate movement of the car.

[0004] Typical elevator systems also include a safety braking device for stopping device for stopping movement of the car under certain conditions. Typical safety devices include brakes that engage one or more surfaces on a guide rail to prevent movement of the car along the guide rail.

[0005] While the guide system and the safety braking system perform different functions, their operation has some interdependence in most situations. Typical rail guide systems have some influence on the working and performance of the safety devices. Depending on the particular design of the safety device, some arrangements are susceptible to an improper alignment between the safety device and the guide shoes. Such misalignment may produce noise, wear in the safety device, nuisance trippings and possible degradation of the safety device performance. Many guide shoes are flexible to provide proper ride comfort and this amplifies any misalignment problem.

[0006] Another difficulty associated with conventional arrangements is that the combination of the rail clearance and the guide shoe stiffness may not allow proper safety device operation. This typically occurs for safety devices that do not have symmetrical operation but can also be problematic with symmetrical arrangements. If this is the case, the performance of the safety device may be compromised. One attempt at addressing this problem is to utilize non-symmetrical safety devices with a flexible mounting for the safety gear, allowing it to move horizontally relative to the guide rail. Such arrangements, however, typically require a relatively large and expensive interface between the safety gear and the elevator car frame.

[0007] It is desirable to reduce the size and complexity of elevator safety devices. One limitation on attempts to achieve this end is that the guide shoe contact surface cannot be used as a braking surface for the safety device function. Normal wear on the guiding surface may de-

grade the performance of the safety device in the event that the safety device were activated. Some elevator codes do not allow such double use of a guide shoe surface.

[0008] Those skilled in the art are always striving to simplify and reduce the weight and size of elevator safety systems while simultaneously improving their performance. This invention accomplishes that goal while avoiding the shortcomings and drawbacks of the prior art.

SUMMARY OF THE INVENTION

[0009] In general terms, this invention is a combined elevator car guiding and safety braking device. Both functions are integrated into a single device that operates in two different modes; one for guiding the elevator car during movement and a second for stopping the elevator car when the safety device is engaged.

[0010] An example elevator car guiding and braking device designed according to this invention includes a base member adapted to be supported for movement with the elevator car. A movable member is supported on the base member to be selectively movable relative to the base member. A guiding member is supported on the movable member such that the guiding member is movable along a guide rail when the movable member is in a first operating position. A braking member also is supported on the movable member such that the braking member can engage the guide rail when the movable member moves into a second operating position.

[0011] In one example, the movable member is a lever that is pivotally supported to pivot relative to the base member between the first and second positions. The guiding member guides movement of the elevator car along the guide rail when the movable member is in the first position. When safety braking is required, the movable member pivots relative to the base member so that the braking member engages the appropriate guide rail surface. The currently preferred arrangement is symmetrical and includes two movable members, one on each side of a guide rail so that two guiding members contact the guide rail during normal elevator movement and two braking members contact the guide rail when the safety device is activated.

[0012] The various features and advantages of this invention will become apparent to those skilled in the art from the following detailed description of the currently preferred embodiments. The drawings that accompany the detailed description can be briefly described as follows.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013]

Figure 1 schematically illustrates selected portions of an elevator system including a guiding and safety braking device designed according to this invention.

Figure 2 schematically illustrates a first example guiding and safety braking device designed according to this invention.

Figure 3 schematically illustrates the embodiment of Figure 2 in a second operation position.

Figure 4 schematically illustrates another example guiding and safety braking device designed according to this invention.

Figure 5 schematically illustrates another example guiding and braking device designed according to this invention in a first operating position.

Figure 6 schematically illustrates the embodiment of Figure 5 in a second operating position.

Figure 7 is a view taken along the lines 7-7 in Figure 5.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0014] Figure 1 schematically illustrates selected portions of an elevator system 20 that is designed according to this invention. An elevator car 22 moves along guide rails 24 in a conventional manner to move within a hoistway between different levels within a building, for example. The inventive system includes a combined guiding and safety braking device 30 that is supported for movement with the elevator car 22 in the hoistway.

[0015] The illustrated example schematically shows one combined guiding and braking device 30 supported on the elevator car 22. A similar device preferably is supported on an opposite side of the elevator car 22 so that a guiding and braking device 30 is associated with each of the guide rails 24. Further, it is within the scope of this invention to support the guiding and braking device 30 on framing associated with the elevator car in a variety of positions or orientations provided that the appropriate contact with the guide rail surfaces are achieved. Those skilled in the art who have the benefit of this description will realize the best way to incorporate a guiding and braking device designed according to this invention into an elevator system to meet the needs of their particular situation.

[0016] Figure 2 schematically illustrates one example combined guiding and braking device 30 designed according to this invention. A base member 32 supports two movable members 34 that are pivotally supported on posts 36 that are secured to the base 32 in a conventional manner. In the illustrated example, the movable members 34 comprise levers that are biased into a first operating position shown in Figure 2 by biasing members 38. The illustrated example includes coil springs as the biasing members 38.

[0017] When the movable members 34 are in the first operating position, guide members 40 are positioned to engage appropriate surfaces on the guide rail 24. In the illustrated example of Figure 2, the guide members 40 comprise rollers that rotate about axes 42 relative to the movable members 34. In another example, the guide

members 40 comprise guide shoes. During normal elevator operation, the guide members 40 follow along the guide rail 24 surfaces to facilitate movement of the car 22 within the hoistway.

5 [0018] The movable members 34 also support braking members 44 that are adapted to engage the guide rail 24 surfaces when safety braking is required. Figure 3 schematically illustrates the first example device in a second operating condition where the movable members 34 have moved to a second position. The illustrated example includes a governor rope 46 and linkage 47 (shown in Figure 3 only) for triggering the safety function of the device 30. Responsive to a force schematically shown at 10 48 on the governor rope 46 and the linkage 47, the movable members 34 are pivoted about the posts 36 as shown by the arrows 49.

[0019] In this second operating position, the guide members 40 are removed from contact with the guide rail 24 and the braking members 44 are moved into operative contact with the appropriate surfaces on the guide rail 24. The triggering action of the force on the governor rope 46 overcomes the bias of the springs 38 to move the movable member 34 into the second operating position where the safety braking function brings the elevator car 22 to a stop as needed.

[0020] The movable members 34 preferably are operated associated with each other with an appropriate linking mechanism (47) so that simultaneous activation of the braking members 44 occurs. Known techniques for triggering a safety braking device using a governor rope are useable with the illustrated examples.

[0021] The two moving members 34 preferably are symmetrically arranged on both sides of the guide rail 24. The inventive arrangement allows for the guide members 40 to be in contact with the rail 24 during normal elevator system operation. In this same position, the braking members 44 are sufficiently clear of the guide rail 24 surfaces 50 that there is no interference from them until needed.

40 [0022] When the safety braking function is required, the movement of the movable members 34 removes the guide members 40 from contact with the guide rails 24 and moves the braking members 44 into contact with the guide rails 24. The inventive arrangement ensures that there is no interference between the functions of the guide members 40 and the braking members 44. Another advantage of the inventive arrangement is that it guarantees proper alignment of the safety braking components with the guide rail 24 because the guide members 40 and the braking members 44 are supported on a common rigid structure.

50 [0023] The example of Figures 2 and 3 includes a cam type braking member 44. Those skilled in the art understand that there are a variety of brake pad materials that are useful for such arrangements. Those skilled in the art who have the benefit of this description will be able to select appropriate materials to meet the needs of their particular situation.

[0024] Figure 4 shows another combined guiding and safety device 30' designed according to this invention. In this example, the braking members 44' are of the so-called progressive type. Biasing members 50, which in the illustrated example are coiled springs, urge the braking members 44' away from the moving members 34 in a manner understood in the art to achieve the desired braking function. The biasing members 50, however, do not urge the braking members 44' away from the movable members 34' in a manner that would cause the braking members 44' to engage the guide rail 24 while the guide members 40 are supposed to be guiding the elevator car 22 during normal system operation. A variety of known guide members and known braking members may be used in a system designed according to this invention.

[0025] Figure 5 illustrates another example combined guiding and safety braking device 30" designed according to this invention. This example includes a unique braking member 44" that operates in a manner that is different than conventional braking members. In this example, the movable members 34" comprise two arms 34a" and 34b" that are positioned on opposite sides of the roller braking member 44". The braking members 44" are supported so that they are capable of rotating relative to the movable members 34" and rolling along the guide rail surfaces.

[0026] As best appreciated from Figure 7, a guide rail contacting surface 60 on the rollers 44" in this example is made from a hardened metal and has a knurled surface. The braking members 44" are adapted to engage the appropriate surface on the guide rail 24 when the governor rope 46 (or other safety brake triggering mechanism) causes movement of the movable members 34" into the second operating position where the braking members 44" engage the guide rail surfaces. Stops, such as posts 61, are supported on the illustrated base 32 to limit movement of the members 34 beyond a desired second position.

[0027] The example arrangement of Figures 5-7 includes braking members supported by the movable members 34" for engaging side surfaces 62 on the rollers 44" to apply a braking force against the rollers but not directly against the guide rail. Brake pads 64 in the illustrated example are supported on the arms 34a" and 34b". The brake pads 64 engage the side surfaces 62 of the rollers 44" to resist rotation of the rollers and to provide the safety braking function.

[0028] This example arrangement has advantages because the potential for deforming or otherwise damaging the surfaces on the guide rail 24 along which the guide members 40 ride, is minimized or eliminated. Applying a braking force parallel to an axis of rotation (i.e., along a support 66) facilitates heat energy dissipation between the brake pads 64 and the roller 44" without requiring energy dissipation on the rails 24 themselves.

[0029] The illustrated example shows in Figure 7 a biasing member 68 such as a Belleville washer that biases the arms 34a" and 34b" toward each other to maintain

appropriate contact between the brake pads 64 and the side surfaces 62 of the rollers 44".

[0030] The inventive arrangement provides cost savings because it reduces the size, complexity and amount of components necessary to achieve the desired elevator car guidance and safety braking functions. The inventive arrangement facilitates easier system assembly and maintenance in addition to the cost-savings advantages just mentioned.

[0031] While several example devices designed according to this invention have been disclosed, other variations are possible that do not depart from the basis of this invention. 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 car guiding and braking device (30) for use in an elevator system (20), comprising: a base member (32) adapted to be supported for movement with an elevator car (22); a moveable member (34) supported on the base member to be selectively moveable relative to the base member; a guiding member (40) supported on the moveable member such that the guiding member is moveable along a guide rail (24) when the moveable member is in a first operating position; and a braking member (44, 44', 44") supported on the moveable member such that the braking member engages the guide rail when the moveable member moves into a second operating position.
2. The device of claim 1, including a biasing member (38) that biases the moveable member into the first operating position.
3. The device of claim 1 or 2, wherein the moveable member (34) comprises a lever that is pivotally supported to pivot relative to the base member between the first and second positions.
4. The device of claim 3, wherein the guiding member (40) and the braking member (44, 44', 44") are supported near opposite ends of the lever.
5. The device of any of claims 1 to 4, including two movable members (34) each supporting a guiding member (40) and a braking member (44) and wherein the moveable members are positioned on the base member (32) such that the braking members are adapted to engage oppositely facing surfaces on the guide rail when the moveable members move into the second position.

6. The device of any of claims 1 to 5, wherein the guiding member (40) comprises a roller.
7. The device of any of claims 1 to 6, wherein the braking member (44,44') comprises a brake shoe and including a biasing member (50) that biases the brake shoe away from the moveable member.
8. The device of any of claims 1 to 7, wherein the braking member (44") comprises a roller supported by the moveable member and a brake (64) associated with the roller, an outer surface (60) on the roller engaging the guide rail (24) when the moveable member moves into the second position, the brake engaging a side surface (62) on the roller to apply a braking force to resist rotation of the roller.
9. The device of claim 8, wherein the roller rail engaging surface (60) comprises a hardened, knurled metal.
10. The device of claim 8 or 9, wherein the brake (50) comprises at least one brake pad engaging a side surface (62) on the braking roller (44"), the brake pads applying a braking force in a direction that is parallel to an axis of rotation of the roller.
11. An elevator system (20), comprising:
a car (22);
a guide rail (24) that guides movement of the car;
a car guiding and braking device (30) according to one of the claims 1 to 10, wherein the guiding device includes at least two moveable members (34) that are supported for movement with the car, that are positioned on opposite sides of a portion of the guide rail and that are moveable between first and second positions;
12. The system of claim 11, including at least one biasing member (38) that biases the moveable members (34) into the first position.
13. The system of claim 11 or 12, wherein the moveable members (34) comprise levers that are pivotally supported to pivot between the first and second positions.
14. The system of claim 13, wherein the guiding members (40) and the braking members (44,44', 44") are supported near opposite ends of the corresponding levers.
15. The system of any of claims 11 to 14, wherein the guiding members (40) each comprise a roller.
16. The system of any of claims 11 to 15, wherein the braking members (44,44') comprises a brake shoe and including a biasing member (50) that biases each brake shoe away from the corresponding moveable member (34).
17. The system of any of claims 11 to 16, wherein the braking members (44") each comprise a roller supported by the corresponding moveable member and a brake (64) associated with each roller, an outer surface (60) on each roller engaging the guide rail (24) when the moveable members (34) move into the second position, each brake engaging a side surface (62) on the corresponding roller to apply a braking force to resist rotation of the roller.
18. The system of claim 17, wherein the roller rail engaging surface (60) comprises a hardened, knurled metal.
19. The system of claim 17 or 18, wherein each brake (64) comprises at least one brake pad engaging a side surface on the braking roller, the brake pads applying a braking force in a direction that is parallel to an axis of rotation of the roller (44").
20. The system of any of claims 11 to 19, including at least one stop member (61) that prevents the moveable members from moving beyond the second position.

Patentansprüche

1. Fahrkorbführungs- und bremsvorrichtung (30) zur Verwendung in einem Aufzugssystem (20) umfassend:
ein Basiselement (32), das dazu ausgebildet ist, zur Bewegung mit einem Aufzugsfahrkorb (22) gehalten zu werden;
ein bewegbares Element (34), das an dem Basiselement gehalten ist, um selektiv relativ zu dem Basiselement bewegbar zu sein;
ein Führungselement (40), das derart an dem bewegbaren Element gehalten ist, dass das Führungselement entlang einer Führungsschiene (24) bewegbar ist, wenn das bewegbare Element in einer ersten Betriebsposition ist; und
ein Bremsselement (44, 44', 44"), das derart an dem bewegbaren Element gehalten ist, dass das Bremsselement die Führungsschiene in Eingriff nimmt, wenn sich das bewegbare Element in eine zweite Betriebsposition bewegt.
2. Vorrichtung nach Anspruch 1, beinhaltend ein Beaufschlagungselement (38), das das bewegbare Element in die erste Betriebsposition beaufschlagt.
3. Vorrichtung nach Anspruch 1 oder 2, wobei das bewegbare Element (34) einen Hebel umfasst, der

drehbar gelagert ist, um sich relativ zu dem Basiselement zwischen der ersten und der zweiten Position zu drehen.

4. Vorrichtung nach Anspruch 3, wobei das Führungselement (40) und das Bremsselement (44, 44', 44'') nahe gegenüberliegender Enden des Hebels gehalten sind. 5
5. Vorrichtung nach einem der Ansprüche 1 bis 4, beinhaltend zwei bewegbare Elemente (34), die jeweils ein Führungselement (40) und ein Bremsselement (44) halten, und wobei die bewegbaren Elemente auf dem Basiselement (32) derart angeordnet sind, dass die Bremsselemente dazu ausgebildet sind, einander gegenüberliegend zugewandte Flächen auf der Führungsschiene in Eingriff zu nehmen, wenn sich die bewegbaren Elemente in die zweite Position bewegen. 10
6. Vorrichtung nach einem der Ansprüche 1 bis 5, wobei das Führungselement (40) eine Rolle umfasst. 15
7. Vorrichtung nach einem der Ansprüche 1 bis 6, wobei das Bremsselement (44, 44') einen Brems Schuh umfasst und ein Beaufschlagungselement (50) beinhaltet, das den Brems Schuh weg von dem bewegbaren Element beaufschlagt. 20
8. Vorrichtung nach einem der Ansprüche 1 bis 7, wobei das Bremsselement (44'') eine Rolle, die von dem bewegbaren Element gehalten ist, und eine Bremse (64) umfasst, die der Rolle zugehörig ist, wobei eine äußere Fläche (60) der Rolle die Führungsschiene (24) in Eingriff nimmt, wenn sich das bewegbare Element in die zweite Position bewegt, wobei die Bremse eine Seitenfläche (62) auf der Rolle in Eingriff nimmt, um eine Bremskraft aufzubringen, um einer Rotation der Rollen zu widerstehen. 25
9. Vorrichtung nach Anspruch 8, wobei die Rolle-Schiene-Eingriffsfläche (60) ein gehärtetes, geriffeltes Metall umfasst. 30
10. Vorrichtung nach Anspruch 8 oder 9, wobei die Bremse (50) zumindest einen Bremsbelag umfasst, der eine Seitenfläche (62) auf der Bremsrolle (44'') in Eingriff nimmt, wobei die Bremsbeläge eine Bremskraft in eine Richtung aufbringen, die parallel zu einer Rotationsachse der Rolle ist. 35
11. Aufzugssystem (20) umfassend: 40
 - einen Fahrkorb (22);
 - eine Führungsschiene (24), die eine Bewegung des Fahrkorbs führt;
 - eine Fahrkorbführungs- und bremsvorrichtung (30) nach einem der Ansprüche 1 bis 10, wobei 45

die Führungsvorrichtung zumindest zwei bewegbare Elemente (34) beinhaltet, die zur Bewegung mit dem Fahrkorb gehalten sind, die an gegenüberliegenden Seiten eines Bereichs der Führungsschiene angeordnet sind, und die zwischen einer ersten und einer zweiten Position bewegbar sind.

12. System nach Anspruch 11, beinhaltend zumindest ein Beaufschlagungselement (38), das die bewegbaren Elemente (34) in die erste Position beaufschlagt. 50
13. System nach Anspruch 11 oder 12, wobei die bewegbaren Elemente (34) Hebel beinhalten, die drehbar gehalten sind, um sich zwischen der ersten und der zweiten Position zu drehen. 55
14. System nach Anspruch 13, wobei die Führungselemente (40) und die Bremsselemente (44, 44', 44'') nahe gegenüberliegender Enden der zugehörigen Hebel gehalten sind.
15. System nach einem der Ansprüche 11 bis 14, wobei die Führungselemente (40) jeweils eine Rolle umfassen.
16. System nach einem der Ansprüche 11 bis 15, wobei die Bremsselemente (44, 44') einen Brems Schuh umfassen und ein Beaufschlagungselement beinhalten, das jeden Brems Schuh weg von dem zugehörigen bewegbaren Element (34) beaufschlagt.
17. System nach einem der Ansprüche 11 bis 16, wobei die Bremsselemente (44'') jeweils eine Rolle, die durch das zugehörige bewegbare Element gehalten ist, und eine Bremse (64) umfassen, die einer jeweiligen Rolle zugehörig ist, wobei eine äußere Fläche (60) auf jeder Rolle die Führungsschiene (24) in Eingriff nimmt, wenn sich die bewegbaren Elemente (34) in die zweite Position bewegen, wobei jede Bremse eine Seitenfläche (62) auf der zugehörigen Rolle in Eingriff nimmt, um eine Bremskraft aufzubringen, um einer Rotation der Rolle zu widerstehen.
18. System nach Anspruch 17, wobei die Rolle-Schienen-Eingriffsfläche (60) ein gehärtetes, geriffeltes Metall umfasst.
19. System nach Anspruch 17 oder 18, wobei jede Bremse (64) zumindest einen Bremsbelag umfasst, der eine Seitenfläche auf der Bremsrolle in Eingriff nimmt, wobei die Bremsbeläge eine Bremskraft in eine Richtung aufbringen, die parallel zu einer Rotationsachse der Rolle (44'') ist.
20. System nach einem der Ansprüche 11 bis 19, beinhaltend zumindest ein Stoppelement (61), das die

bewegbaren Elemente daran hindert, sich über die zweite Position hinaus zu bewegen.

Revendications

1. Dispositif de guidage et de freinage de cabine (30) destiné à être utilisé dans un système d'ascenseur (20), comprenant : un élément de base (32) adapté de sorte à être soutenu pour se déplacer avec une cabine d'ascenseur (22) ; un élément mobile (34) soutenu sur l'élément de base pour être mobile de manière sélective par rapport à l'élément de base ; un élément de guidage (40) soutenu sur l'élément mobile de sorte que l'élément de guidage soit mobile le long d'un rail de guidage (24) lorsque l'élément mobile est dans une première position de fonctionnement ; et un élément de freinage (44, 44', 44'') soutenu sur l'élément mobile de sorte que l'élément de freinage engage le rail de guidage lorsque l'élément mobile se déplace dans une seconde position de fonctionnement.
2. Dispositif selon la revendication 1, comprenant un élément de rappel (38) qui contraint l'élément mobile dans la première position de fonctionnement.
3. Dispositif selon la revendication 1 ou 2, dans lequel l'élément mobile (34) comprend un levier qui est soutenu de manière pivotante pour pivoter par rapport à l'élément de base entre les première et seconde positions.
4. Dispositif selon la revendication 3, dans lequel l'élément de guidage (40) et l'élément de freinage (44, 44', 44'') sont soutenus près des extrémités opposées du levier.
5. Dispositif selon l'une quelconque des revendications 1 à 4, comprenant deux éléments mobiles (34), chacun soutenant un élément de guidage (40) et un élément de freinage (44) et dans lequel les éléments mobiles sont positionnés sur l'élément de base (32) de sorte que les éléments de freinage soient adaptés pour engager des surfaces se faisant face de manière opposée sur le rail de guidage lorsque les éléments mobiles se déplacent dans la seconde position.
6. Dispositif selon l'une quelconque des revendications 1 à 5, dans lequel l'élément de guidage (40) comprend un rouleau.
7. Dispositif selon l'une quelconque des revendications 1 à 6, dans lequel l'élément de freinage (44, 44') comprend une mâchoire de frein et comprenant un élément de rappel (50) qui contraint la mâchoire de frein loin de l'élément mobile.

8. Dispositif selon l'une quelconque des revendications 1 à 7, dans lequel l'élément de freinage (44'') comprend un rouleau soutenu par l'élément mobile et un frein (64) associé au rouleau, une surface extérieure (60) sur le rouleau engageant le rail de guidage (24) lorsque l'élément mobile se déplace dans la seconde position, le frein engageant une surface latérale (62) sur le rouleau pour appliquer une force de freinage en vue de résister à la rotation du rouleau.
9. Dispositif selon la revendication 8, dans lequel la surface du rouleau engageant le rail (60) comprend un métal durci, moleté.
10. Dispositif selon la revendication 8 ou 9, dans lequel le frein (50) comprend au moins une plaquette de frein à disque engageant une surface latérale (62) sur le rouleau de freinage (44''), les plaquettes de frein à disque appliquant une force de freinage dans une direction parallèle à un axe de rotation du rouleau.
11. Système d'ascenseur (20), comprenant :
une cabine (22) ;
un rail de guidage (24) qui guide le mouvement de la cabine ;
un dispositif de guidage et de freinage de la cabine (30) selon l'une quelconque des revendications 1 à 10, dans lequel le dispositif de guidage comprend au moins deux éléments mobiles (34) qui sont soutenus pour se déplacer avec la cabine, qui sont positionnés sur des côtés opposés d'une partie du rail de guidage et qui sont mobiles entre une première et seconde positions.
12. Système selon la revendication 11, comprenant au moins un élément de rappel (38) qui contraint les éléments mobiles (34) dans la première position.
13. Système selon la revendication 11 ou 12, dans lequel les éléments mobiles (34) comprennent des leviers qui sont supportés de manière pivotante pour pivoter entre la première et seconde positions.
14. Système selon la revendication 13, dans lequel les éléments de guidage (40) et les éléments de freinage (44, 44', 44'') sont soutenus près des extrémités opposées des leviers correspondants.
15. Système selon l'une quelconque des revendications 11 à 14, dans lequel les éléments de guidage (40) comprennent chacun un rouleau.
16. Système selon l'une quelconque des revendications 11 à 15, dans lequel les éléments de freinage (44, 44') comprennent une mâchoire de frein et compre-

nant un élément de rappel (50) qui contraint chaque mâchoire de frein loin de l'élément mobile correspondant (34).

17. Système selon l'une quelconque des revendications 11 à 16, dans lequel les éléments de freinage (44") comprennent chacun un rouleau soutenu par l'élément mobile correspondant et un frein (64) associé à chaque rouleau, une surface extérieure (60) sur chaque rouleau engageant le rail de guidage (24) lorsque les éléments mobiles (34) se déplacent dans la seconde position, chaque frein engageant une surface latérale (62) sur le rouleau correspondant pour appliquer une force de freinage en vue de résister à la rotation du rouleau. 5
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18. Système selon la revendication 17, dans lequel la surface de rouleau engageant le rail (60) comprend un métal durci, moleté. 20
19. Système selon la revendication 17 ou 18, dans lequel chaque frein (64) comprend au moins une plaque de frein à disque engageant une surface latérale sur le rouleau de freinage, les plaquettes de frein à disque appliquant une force de freinage dans une direction parallèle à un axe de rotation du rouleau (44"). 25
20. Système selon l'une quelconque des revendications 11 à 19, comprenant au moins un élément d'arrêt (61) qui empêche le déplacement des éléments mobiles au-delà de la seconde position. 30

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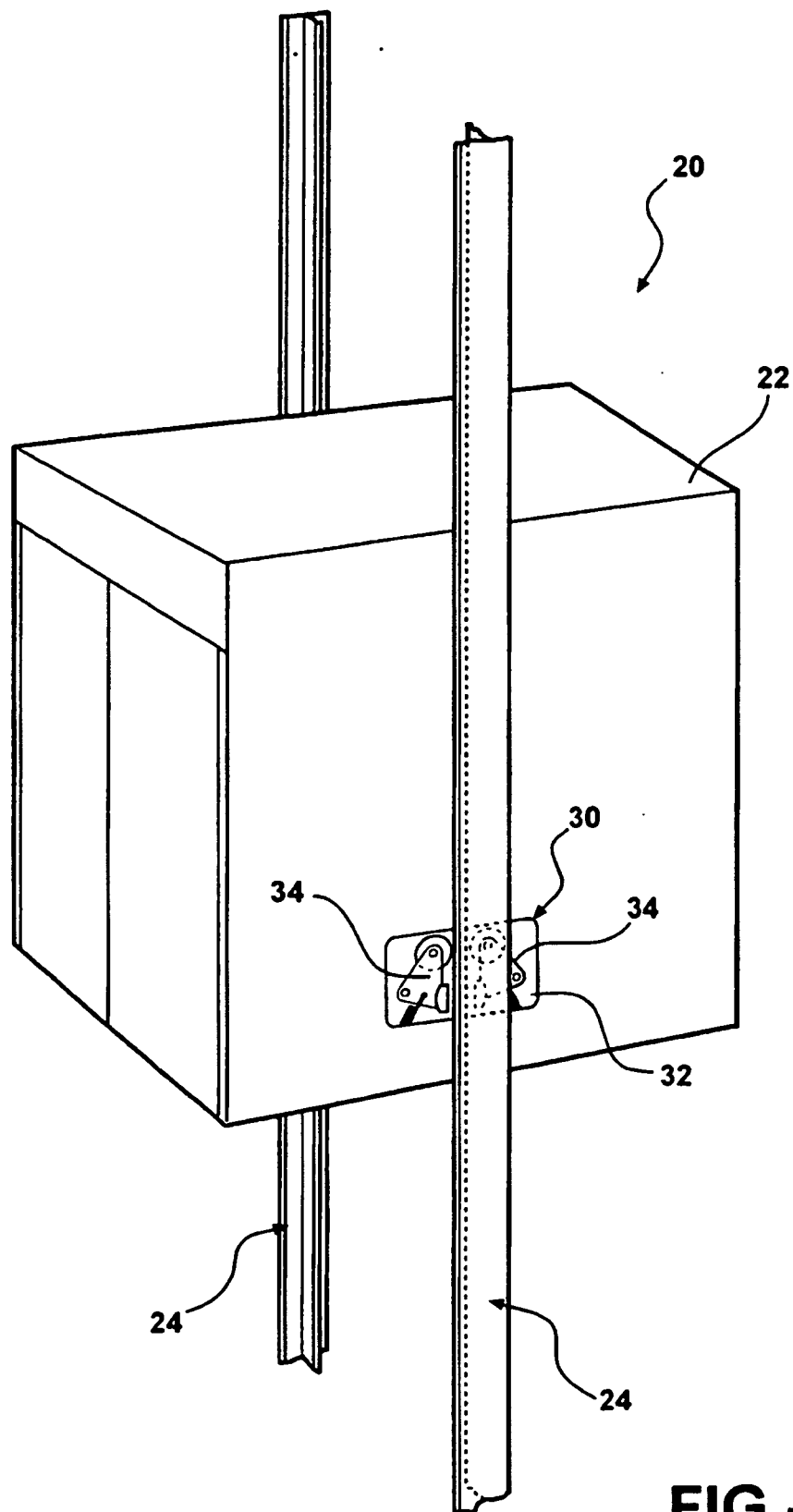


FIG - 1

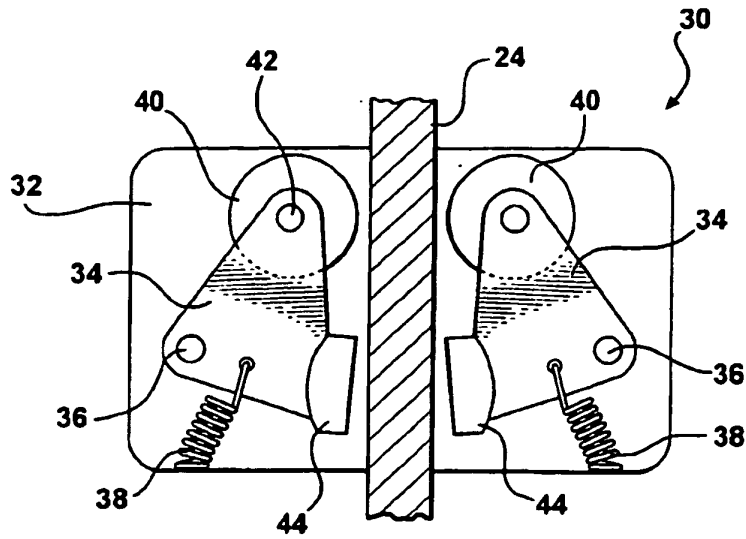


FIG - 2

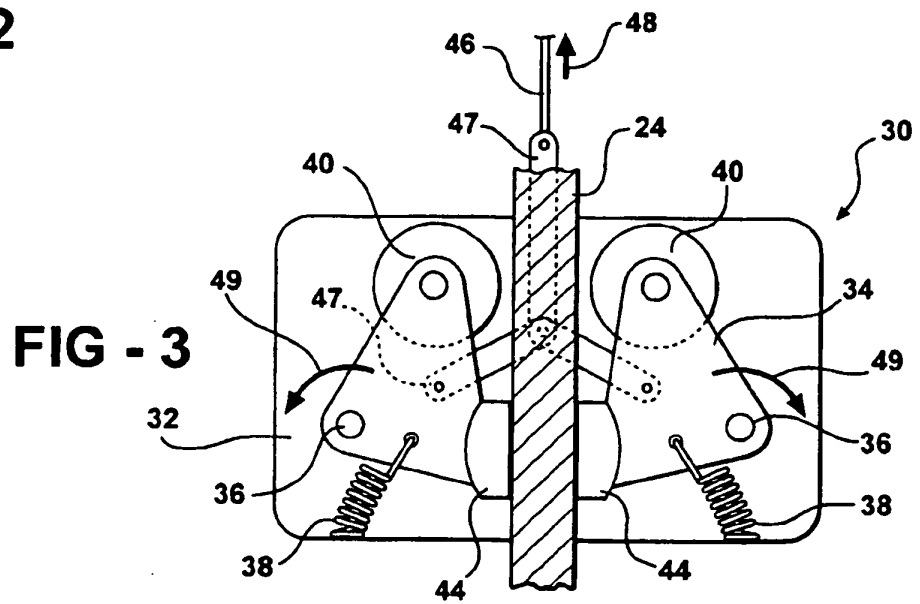


FIG - 3

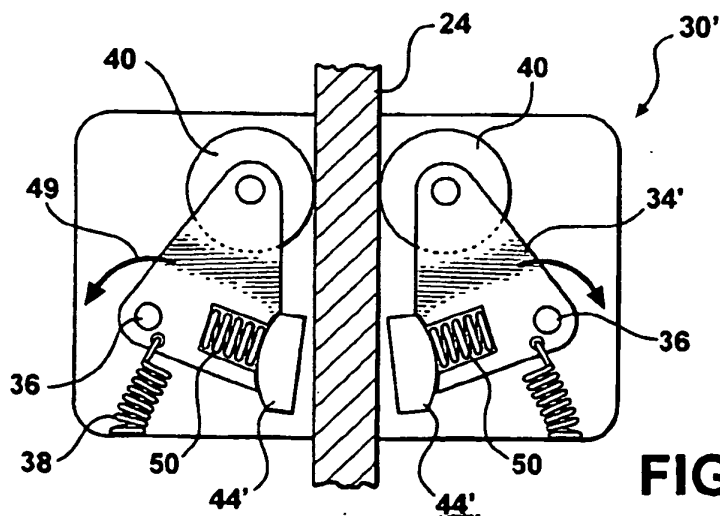
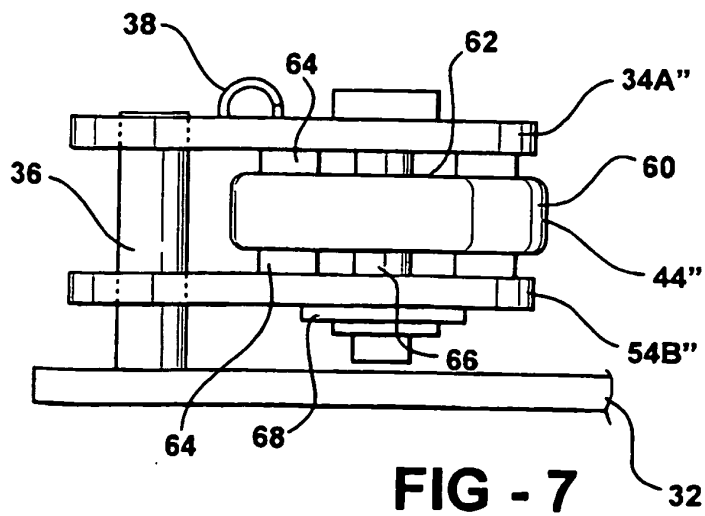
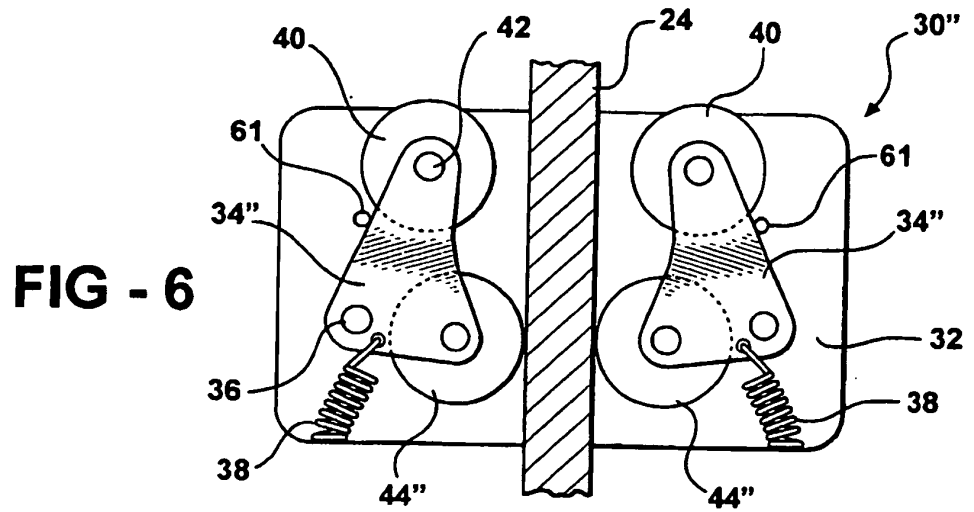
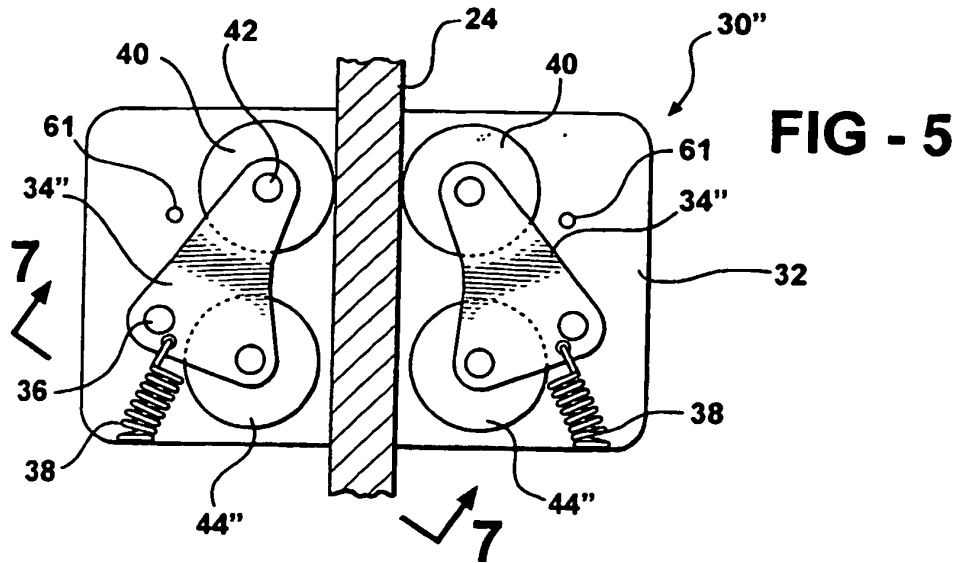


FIG - 4



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- GB 400157 A [0002]