A Revolutionary New Elevator System
Multiple Cabs Operate Independently In The Same Hoistway

Smart Lifts is a revolutionary new patented elevator system enabling multiple elevator cabs to move independently of each other (up or down) in the same elevator shaft. The Smart Lifts system is controlled by a sophisticated failsafe patent pending computer control system that operates and coordinates the motions, destinations, and all functions of each cab.

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FIGURE 3
The top view of 10 cabs in the same elevator shaft showing horizontally spaced-apart counterweights and suspension cables in each quadrant of the shaft.

FIGURE 4
Alternative suspension systems only require one or two counterweights and one or two groups of suspension cables symmetrically located on each side of each cab.
FIGURE 5
The side view of two Smart Lifts elevator shafts which shows how four elevator cabs can move independently of each other from the bottom of a shaft to the top of a shaft, or vice-versa, over 6 minutes of time.

This results in a circular pattern of moving elevator cabs and a continuous supply of elevator cabs arriving at each floor of a building in different directions.
FIGURE 6

The side view of a stationary elevator frame (101) suspended by cables in an elevator shaft (100) with a detached elevator cab exiting the shaft through specially designed lobby doors. The cab (with or without) passengers inside, may then move on its motorized wheels horizontally around the floor of the building, or may move on its motorized wheels to another building and automatically reattach to a identical elevator frame in another elevator shaft, and then move up and down in that building.
FIGURE 7
The side view of two stationary elevator frames (101A, 101B), each suspended by cables in two adjacent elevator shafts (100A, 100B), with passengers walking from one specially designed elevator cab (160) to the other through open rear sliding doors (400) without accessing a lobby.
What is the problem with conventional elevators that have been used in tall buildings for the last 100 years?

Conventional elevator cabs are suspended in an elevator shaft by cables that are attached to the top center of the cab. Therefore, only one elevator cab can be operated in each elevator shaft. The rest of the shaft is not used most of the time.

How are Smart Lifts elevator cabs suspended in an elevator shaft?

In the Smart Lifts system, the suspension cables that are connected to each cab are located outside of the pathway of the cabs, or they travel up and down with the cabs. Therefore, multiple elevator cabs can be operated independently of each other in each elevator shaft.

What is the major advantage of the Smart Lifts suspension system?

The number of elevator shafts and associated lobbies in any tall building or other structure can be greatly reduced. The floor space that is added to each floor of a building because of fewer elevator shafts can be used for more productive purposes, such as leased office space or more residential space. Thus, it is economically feasible to construct much taller buildings on very expensive land.

How would these advantages benefit the owner or developer of a tall building?

In a building the size of the Freedom Tower in New York City, the extra income from more leased office space would be approximately $50,000,000/year (that is over $500,000,000/decade). Another benefit would be less cost of construction and operations, because many costly and unnecessary elevator shafts and associated lobbies would not have to be built or maintained.

Can the Smart Lifts elevator system be applied to other buildings with other uses?

Yes. It can be applied to hotels, hospitals, department stores, loft buildings, vertical parking structures, almost any building or structure.

Can the Smart Lifts elevator system be used in existing tall buildings?

Yes. All that is necessary is to remove some of the existing elevator equipment and replace it with the Smart Lifts suspension system. The existing elevator cabs can be modified to support the Smart Lifts suspension system and some of the elevator shafts may be retained. The remaining unnecessary elevator shafts and lobbies may then be demolished and replaced with more productive uses.
How do the multiple cabs operate independently of each other in the same elevator shaft without colliding?
All of the elevator cabs in each shaft only move in the same direction: either up or down. The unique failsafe patent pending Smart Lifts computer control system and electronic sensors prevent cabs from moving too close to each other or colliding.

What happens in the morning when the first employees enter a tall office building?
The top elevator cab (located on the ground floor) begins to load passengers. There are two or more cabs below the top cab, and drivers leave their parked cars and enter into each of the lower cabs. When the top cab is filled with passengers it starts up the elevator shaft and begins to let passengers off at their desired floor destinations. As soon as the top cab moves up, the lower cabs all move up one floor. When the second cab is filled with passengers from the ground floor it starts up the elevator shaft and the lower cabs each move up one more floor. This process repeats itself until all of the cabs are moving up the elevator shaft. (see Fig. 5)

How do passengers in the lowest elevator cab in a shaft reach their destination on the top floor of a building?
When the top elevator cab in a shaft unloads its passengers on the top floor of a building, it continues moving upward into an elevator cab parking slot in the attic. Each of the next lower cabs do the same. When the lowest elevator cab reaches the top floor of the building it unloads its remaining passengers, and then reverses its direction of travel and moves down the elevator shaft. Thereafter each of the parked elevator cabs in the attic slots follows the lowest cab down the elevator shaft. (see Fig. 5)

If all cabs in a shaft only move in the same direction, then how long must a passenger wait to go in the opposite direction?
Not long. Normally there are at least two elevator shafts in the same tall building. While all of the cabs in one elevator shaft are moving upward, all of the cabs in another elevator shaft are moving downward. This results in a circular pattern of moving elevator cabs and a continuous supply of elevator cabs arriving at each floor of a building.
How fast can many potential passengers reach their desired floors in a very tall building?
During the early morning hours each cab in an elevator shaft can express upward at the top speed of 5 meters/sec. to a different group of floors, then drop off their passengers at different floors of that group, and then (in sequence) express back to the lowest floors (without any passengers) to pick up many more passengers. These cabs may continue this process until most of the employees who work in the building have reached their desired floors. At the end of the day all cabs in a shaft can express at top speed (without any passengers) upward to different groups of floors, pick up passengers at different floors of that group and then (in sequence) express back to the lowest floors to drop off their passengers, who will then exit the building.

Are there any other applications of the Smart Lifts system?
Yes. The Smart Lifts system can be used in a tall thin tower such as the Washington Monument or the Space Needle in Seattle. It can also be used in a deep underground mine.

What are the advantages of using the Smart Lifts system in a deep mine?
In a deep mine only one elevator shaft is required. Up to 20 elevator cabs can be used with the Smart Lifts system in that shaft, each serving a horizontal mine shaft. After all of the cabs are filled with ore they can be raised to the surface and unloaded. Deep mine shafts are very expensive to construct, and only one vertical shaft is needed.

Can the Smart Lifts system help companies with several vertically adjoining floors in a tall building?
Yes. If one shaft in a tall building is dedicated to private elevator cabs, each company with several vertically adjoining floors can operate a private elevator cab between such adjoining floors. This allows each company’s employees to have better and quicker access to employees on other vertically adjoining floors, so they don’t have to waste time or risk company confidentiality using the building’s public elevator cabs.
Is there any other advantage to having many private elevators cabs moving between adjoining floors of the same company?
Yes. Private elevator cabs can take a big passenger load off of the public elevator cabs. Thus, fewer public elevator shafts are necessary in a tall building with all of the benefits of fewer elevator shafts, and the public elevator cabs of the building that are needed can service their passengers more efficiently.

Can the Smart Lifts system also be used for low-rise buildings?
Yes, the Smart Lifts suspension and computer control systems can be adapted to operate in a low-rise building or a mid-rise building where only 2 or 3 elevator cabs are needed to operate independently of each other in an elevator shaft.

Can 5, 8, or even 10 elevator cabs operate independently in the same elevator shaft in a very tall building (i.e. with 150 to 300 floors)?
Yes. For example, in a 200-story building 10 cabs can move passengers between floors 1 to 150 in one shaft, and 10 other cabs can move passengers between floors 50 and 200 in another shaft. There is an overlap of passenger service between floors 50 to 150. The Smart Lifts computer control system can then tell passengers who want to travel to higher or lower floors than their original cabs will access, to transfer to another cab in the other shaft at a time when the cabs overlap their passenger service.

Can any Smart Lifts cabs move in other directions?
Yes. Specially constructed elevator cabs can quickly move horizontally from one elevator shaft to another elevator shaft, or from one elevator shaft to the floor of a building, or from one tall building to another tall building. (see Fig. 6 & Fig. 7)

Can the Smart Lifts system be used during the initial construction of a tall building, or during the remodeling or repair of an existing building?
Yes. The Smart Lifts system with many construction cabs operating in each elevator shaft, can be used as a vertical and/or horizontal transporter of workers or materials to or from any floor of the building, or horizontally to or from any place on any floor. This means that the initial construction of the building, or remodeling of an existing building, can be completed much more rapidly, efficiently, and cost effectively.
Would there be any advantages for the cities where Smart Lifts elevator systems were installed?

There would be a large number of jobs created retrofitting existing buildings with the Smart Lifts system, demolishing unnecessary elevator shafts and lobbies, and building out the new space created with more productive uses, not to mention the jobs created for more productive uses and the much taller buildings that could be constructed.