United States Patent

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[54] **IDLE CAR STORAGE AND DISPENSING SYSTEM**
8 Claims, 5 Drawing Figs.

[52] **U.S. Cl.** **104/252,** 104/168
[51] **Int. Cl.** **B61k 7/18**
[50] **Field of Search** b61b/13/12; 104/165, 166, 168, 170, 252, 253

[56] **References Cited**

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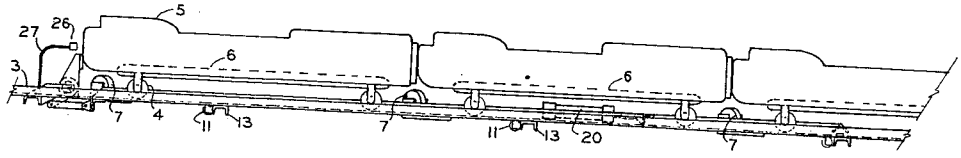
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Assistant Examiner—Robert Saifer
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ABSTRACT: Idle cars of a baggage handling system suitable for use in busy airports are stored on sidings in a storage area. Each siding has a retractable stop arranged to arrest the leading car on the siding and a plurality of powered drive wheels on a reciprocable frame, the drive wheels cooperating with a member on the car to drive the car. The member is of lesser length than the overall length of the car and the drive wheels are spaced at intervals equal to the overall length of a car such that the drive wheels are out of engagement with the members when the car or cars are arrested by the stop. To release a car from storage the stop is withdrawn and the frame shifted to engage the drive wheels with the car members. The first drive wheel provides a higher speed than the others to open a gap between the first and the following cars such that the stop may be returned to arresting position prior to arrival of the next car at that position.



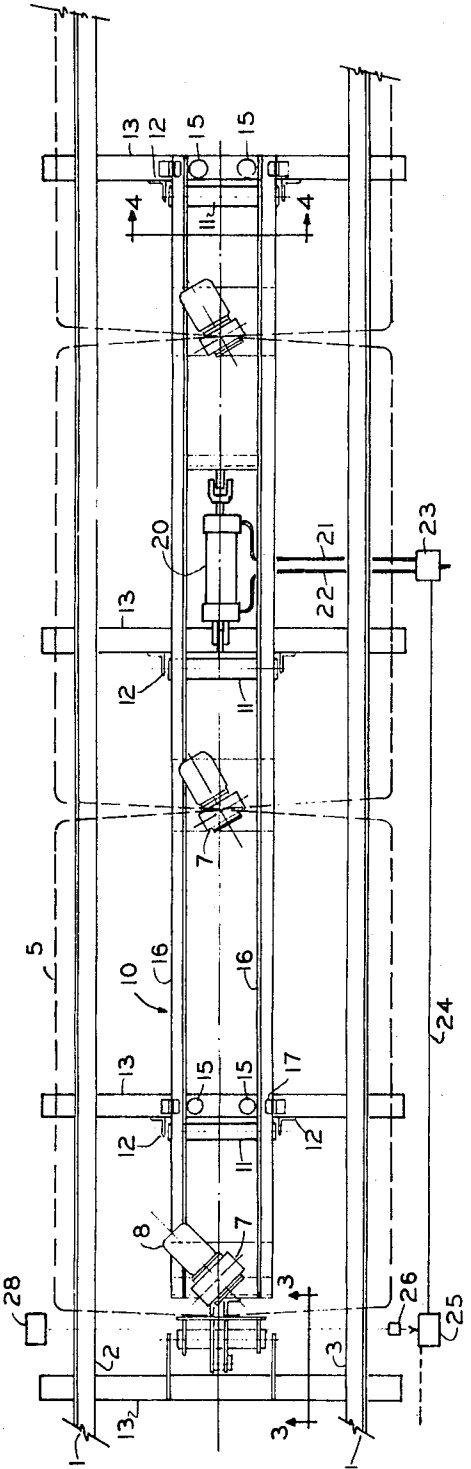


FIG NO. 1

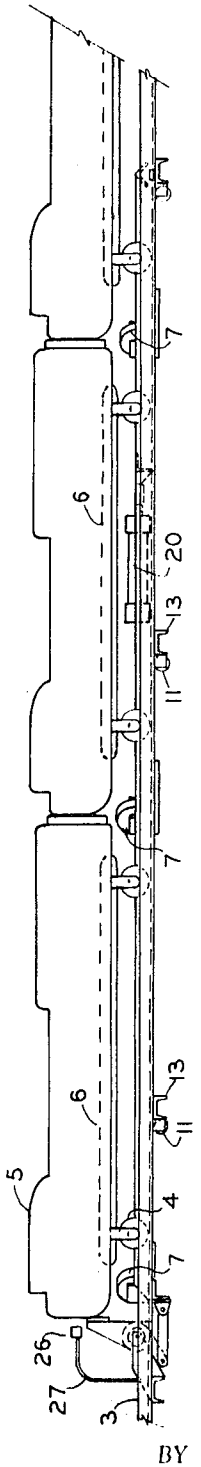


FIG. NO. 2

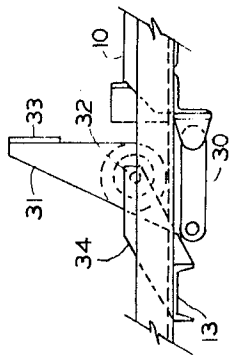


FIG NO. 3

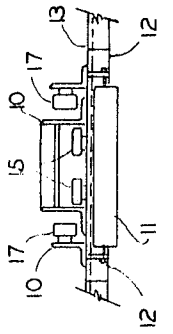


FIG NO. 4

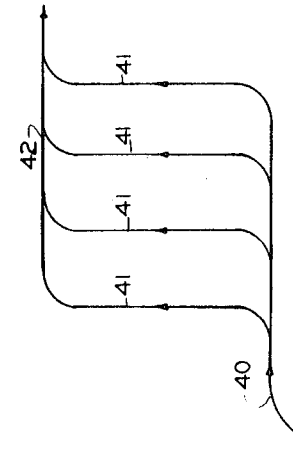


FIG NO. 5

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IDLE CAR STORAGE AND DISPENSING SYSTEM

SUMMARY OF THE INVENTION

This invention relates to baggage transportation systems for use in large airports or similar areas where articles must be quickly transported between a large number of separated areas, and in particular, to means for holding and driving idle cars in a parking or storage area. According to the invention, a retractable stop is mounted in the trackway at a position such that the car, or series of cars, is stopped with its reaction tube out of contact with powered drive rollers mounted on a movable frame in the track. The powered drive roller frame is shiftable lengthwise so that it may be moved from its idle position (rollers intermediate the reaction tubes of stopped cars) to an active position where the rollers engage the reaction tubes. Preferably the drive roller frame is interconnected with the arresting means or stop so that the operations are synchronized. A preferred form of the invention is illustrated in the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings

FIG. 1 is a plan view of a section of track including a stop and movable power drive means with arrested cars shown in phantom.

FIG. 2 is a side elevation of the section of track.

FIG. 3 is an enlarged side elevation of a stop for arresting the cars as seen from the line 3—3 of FIG. 1.

FIG. 4 is a vertical section of a movable frame carrying car drive means as seen from the line 4—4 of FIG. 1.

FIG. 5 is a schematic layout of a car-holding area in which a car stop and movable drive means may be employed.

These specific figures and the accompanying description are intended merely to illustrate the invention but not to impose limitations on the claims.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIGS. 1 and 2, the improved accumulating and dispensing station comprises a length of track 1 which may be part of the trackage of a holding or car storage area. The track 1 comprises, along its sides, angle irons 2, 3 on which load-bearing wheels 4 of a luggage carrier or car is adapted to run. Referring to FIG. 2, each of the cars 5 has a reaction tube 6 extending lengthwise of the car and journaled for rotation about its longitudinal axis. The reaction tube 6 cooperates with drive rollers 7 mounted at intervals along the track and set at angles corresponding to the speed at which the car is to travel past a particular drive wheel. Each of the drive wheels 7 is provided with its own drive motor 8. These motors may be constant speed induction motors since the speed of the car is controlled by varying the angle between the axis of the drive wheel and the track.

In the accumulating area the drive rollers 7 with their individual motors 8 are mounted on a longitudinally extending frame 10 that is carried on rollers 11 journaled in brackets 12 attached by crossties 13 of the track. The frame 10 is guided laterally by rollers 15 mounted on the top of the ties 13 in position to engage the inner sides of angle irons 16 making up the longitudinal members of the frame 10.

While the weight of the drive wheels 7, motors 8 and frame 10 tend to hold the frame down on the rollers 11, any upward motion is positively prevented by guard rollers 17 mounted from the crossties 13 and overlying the flanges of the angle iron 16.

The frame 10 is reciprocated lengthwise by means of an air cylinder 20 mounted on a bracket attached to the crosstie 13. An hydraulic cylinder may be used instead of an air cylinder if desired. The air cylinder 20 is controlled through air lines 21, 22 from an electrically operated valve mechanism 23 which in turn is controlled by an electrical control line 24 from a photoelectric control circuit housed in a control box 25. A photocell 26 of the circuit is mounted on a pipe 27 erected from the crosstie 13 in position to receive light from a light source 28, similarly mounted, as long as there is no car interrupting the light path.

When the light path is uninterrupted the control energizes the air cylinder 20 to drive the frame 10 toward the left, as shown in FIG. 1, and the frame 10 through a connecting link 30 pivotally connected to a downwardly extending arm of a stop bracket 31 rotates the bracket about its pivot axis 32 to bring its stop plate 33 into position to meet the bumper of a car 5 and arrest the car. The pivot axis 32 of the stop bracket 31 is carried on fixed arms 34 erected from a tie 13. When the frame 10 is moved to the right, as shown in FIG. 1, by proper energization of the air cylinder 20, the stop 33 is moved to an unobstructing position to allow any car to pass that location at the same time that the drive rollers are moved into engagement with the reaction tubes 6 of the stopped cars.

It may be noted that the drive rollers 7 are spaced apart along the frame 10 at intervals equal in length to the length of the cars 5. This is true except that the drive roller 7 adjacent the stop mechanism may be positioned a little closer to its adjacent drive roller inasmuch as the car is accurately located in position at that point. The important thing is that the drive rollers 7 are located so as to not engage the rotatable reaction tubes 6 of the stopped cars. Thus, as shown in FIG. 2, the leftmost drive roller 7 is located intermediate the stop and the left end of the adjacent car's reaction tube 6 while the drive rollers 7 remote from the stop are located substantially midway between the adjacent ends of the drive reaction tubes 6 of the following cars.

FIG. 5 shows a typical plan layout of the track paths through a holding or parking area and, as shown, comprises an incoming track 40, a series of parallel siding or parking tracks 41 and an exit track 42. Each of the siding tracks 41 is provided with a frame 10 including drive motors 8 and arranged under the controls of an air cylinder or hydraulic cylinder 20 which in turn is responsive to the controls of the overall system. Any idle cars in the system are directed into the holding area and enter on the track 40 from which they are switched on to a selected one of a siding tracks 41 according to the number of cars already in the area. A car entering a siding 41 travels along the siding until it either encounters a preceding car already in the siding or until it engages the stop 33 near the end of the siding. The stop is located just before a curve leading into the merging switches leading to the exit track 42. An incoming car coasts from the time its reaction tube 6 leaves one drive wheel 7 until it engages the next drive wheel.

When a car is required to leave the holding zone an appropriate signal is transmitted through the control 25 to the air cylinder 20 causes it to move the frame 10 to the right, as shown in FIG. 1, so that the drive wheels 7 engage the reaction tubes of the cars standing in that siding. At the same time, the stop is retracted. The first drive wheel 7 at the left end of the frame 10 engages the first car 5 in the line of cars, and being set at a relatively steep angle, drives that car out of the siding at a fairly rapid rate. The remaining drive wheels 7, including their drive motors 8, are set with their shafts more nearly parallel with the length of the frame 10 so that the succeeding cars are driven forward at a lower rate of speed upon engagement with these drive wheels. This allows the first car in the line to leave rapidly and the other cars to creep forward. This opens up a space between the leading car and the next car such that the photocell 26 receives light from the light source 28 as soon as the first car leaves the siding in time to reposition the frame 10 and raise the stop 33 into arresting position before the next car reaches the stop position. Thus, upon withdrawal of a car from the holding area, the remaining cars on that particular siding all move forward one car length.

This preferred embodiment of the invention provides means for automatically causing the incoming cars to creep into position in line on each of the sidings, the siding being selected by switching means not shown, and to be held in position on such siding until required for further use in the system. Furthermore, the cars are automatically advanced on each siding as the leading cars are withdrawn and automatically disengaged from the drive power when they reach the parking position.

We claim:

1. In a system having a plurality of cars that travel along a track, means for controlling the movement of cars past a holding station, comprising power drive means, means mounting the power drive means for reciprocation between a first and a second position along the track, a member in each car that engages the drive means throughout a portion of the car's travel past a point in the track and that is free of the drive means during the remainder of its travel past the point, said power drive means and said member cooperating to produce relative motion between the drive means and the car, a stop mounted in the track for arresting a car when its member is free from the drive means and the drive means is in its first position, means for withdrawing the stop, and means for moving the power drive means along the track to its second position at which it engages the member of the stopped car and drives the car.

2. A system according to claim 1 comprising a mechanical linkage connecting the stop means to the means for moving the power drive means.

3. A system according to claim 1 having the drive means adjacent the stop arranged to drive a car at a substantially higher speed than the remaining drive means.

4. In a system according to claim 1 a movable frame in which the power drive means are mounted at intervals generally equal to the overall length of a car.

5. In a system according to claim 4 power means responsive to a demand signal connected to said movable frame and said stop for withdrawing the stop and for moving the frame to car drive position.

6. In a system according to claim 5, means for generating a clear signal as a car passes the withdrawn stop, and means responsive to a no demand signal and the clear signal for returning said stop to car arresting position.

7. A system according to claim 1 in which the power drive means comprise drive wheels journaled in a frame and the member engaging the drive wheels comprises a longitudinally extending tube extending lengthwise of the car and journaled for rotation about its axis.

8. A system according to claim 7 in which the drive wheel adjacent the stop is oriented at a steeper angle of attack than other drive wheels journaled on the frame.

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