May 7, 1957 J. L. GRONDONA 2,791,291

STORE

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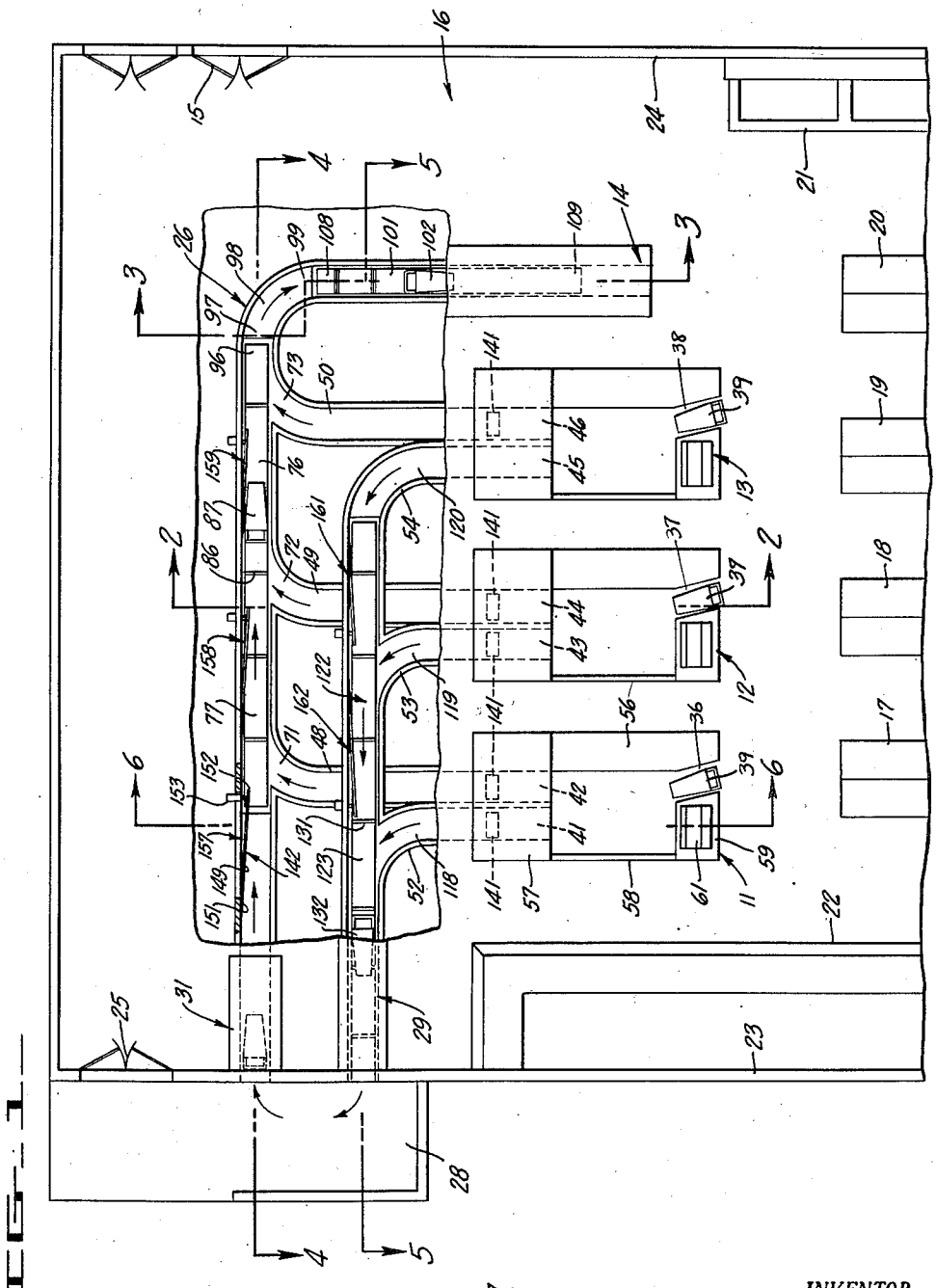


FIG. 1

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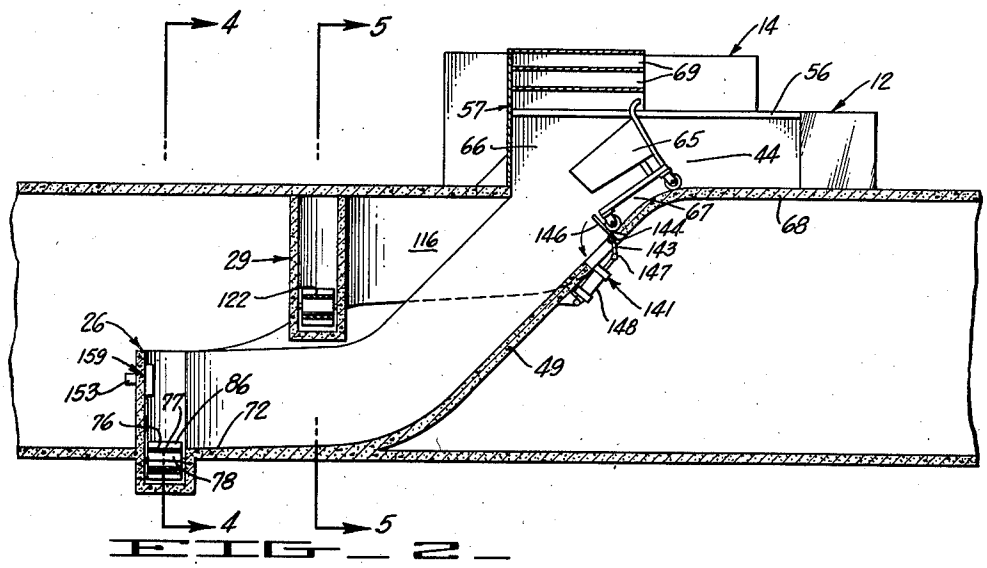


FIG. 2

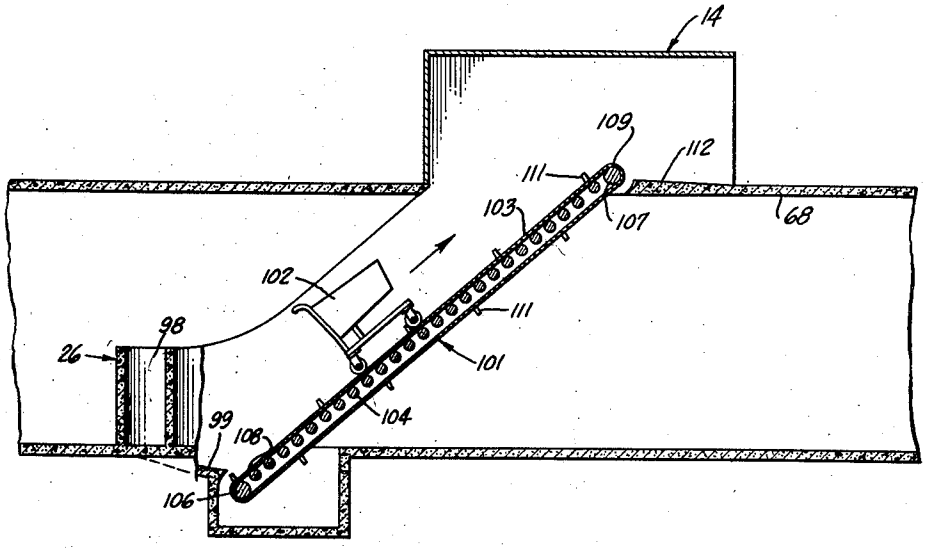


FIG. 3

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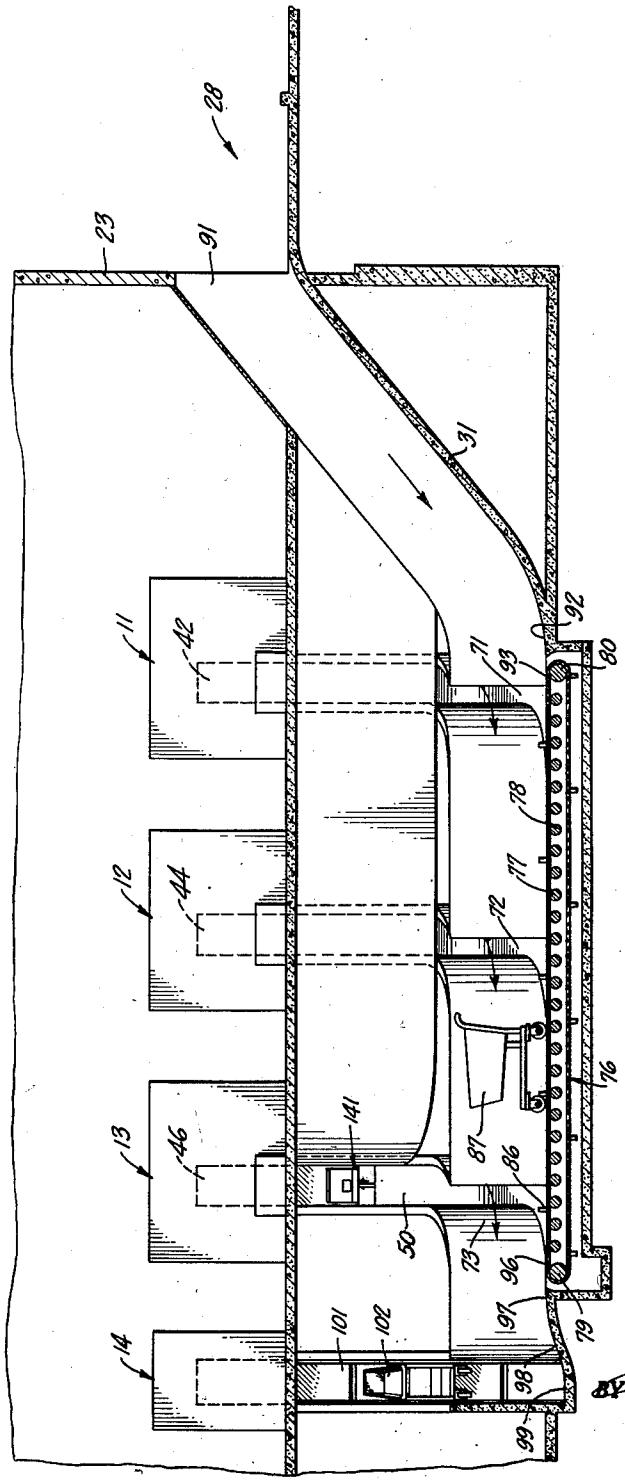


FIG. 4

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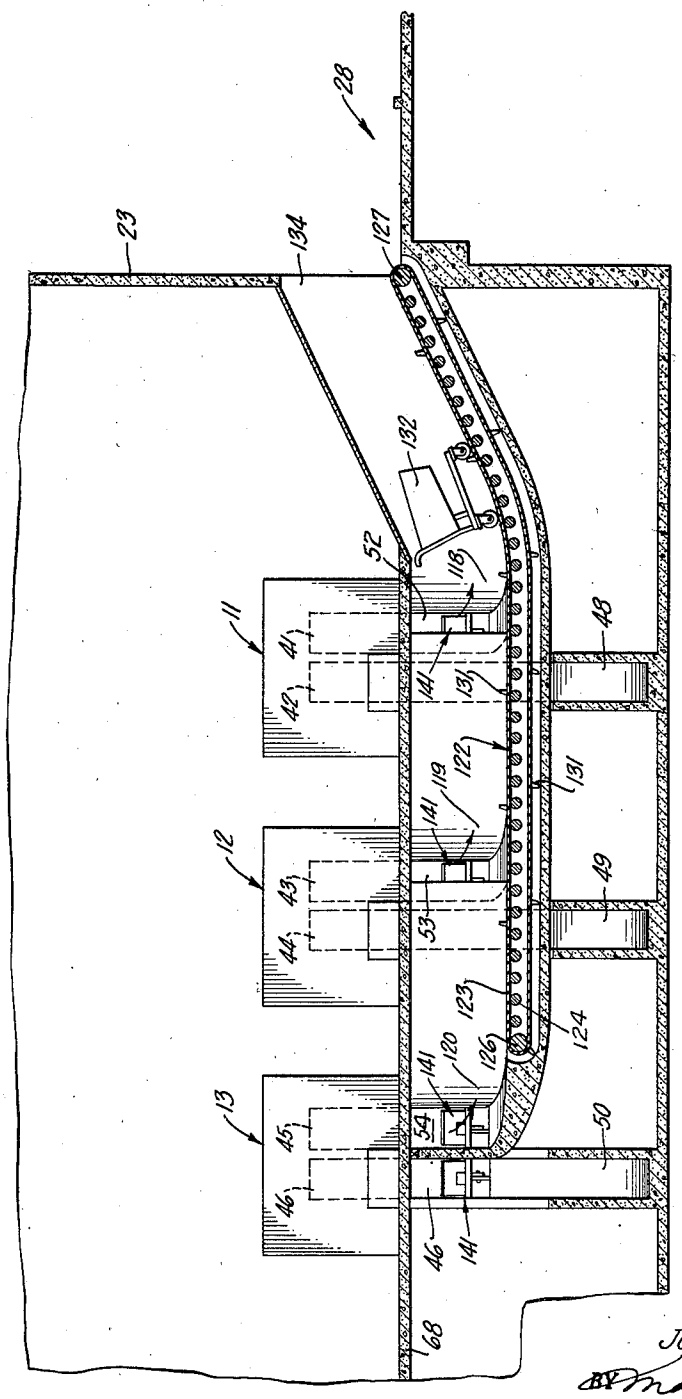


FIG. 5

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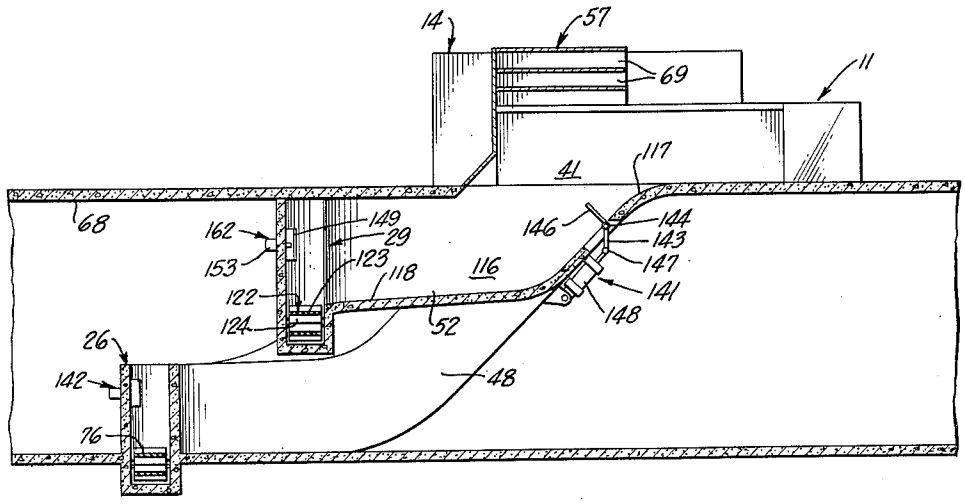


FIG. 6

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United States Patent Office 2,791,291 Patented May 7, 1957

2,791,291

STORE

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Application September 16, 1955, Serial No. 534,826

4 Claims. (Cl. 186—1)

The invention relates to store designs, particularly as employed for large so-called super markets which employ a self-help type of service in the dispensing of merchandise and which have a large number of roll-about carts or buggies for use by the patrons in accumulating merchandise from different parts of the store and for transportation of the selected merchandise to check-out counters.

In large, busy markets of the character described, it is a common experience to find empty food carts scattered all over the floor and about the store, and in many instances blocking the aisles, and the clerks are required to run about in a continuous effort to gather up the carts and push them into an area near the store entrance where they will be available for taking by incoming patrons. It is accordingly an object of the present invention to provide in a store of the character described apparatus, design and lay-out which will effect and make possible an orderly and systematic handling of the customary roll-about food carts so that they will be easily and quickly disposed of at or adjacent to the merchandise checking station or counter and may be automatically made conveniently available to the patrons adjacent the store entry or other desired location within the store to thereby afford a substantial reduction in clerical labor and to obtain an improved and more efficient traffic flow through and service in the store.

Another object of the present invention is to provide a store construction of the character described which will integrate into the cart handling system a parking lot station adjoining the store building and to make provision for the routing of loaded carts from the merchandise checking station within the store to the parking lot station for convenient unloading of the carts into the automobiles of the patrons, and for the return of the empty carts from the parking lot station to an empty cart station within the store.

A further object of the present invention is to provide a store construction of the character above which may be incorporated in many existing stores with a requirement for a minimum of re-arrangement and reconstruction, or which may be incorporated in new store construction at a modest and economically feasible cost.

The invention possesses other objects and features of advantage, some of which, with the foregoing, will be set forth in the following description of the preferred form of the invention and which is illustrated in the drawings accompanying and forming part of the specification. It is to be understood, however, that variations in the showing made by the said drawings and description may be adopted within the scope of the invention as set forth in the claims.

Referring to said drawings:

Figure 1 is a plan view of a portion of a store constructed in accordance with the present invention and with portions broken away and shown in cross-section.

Figure 2 is a vertical sectional view on an enlarged scale of a portion of the store taken substantially on the plane of line 2—2 of Figure 1.

Figure 3 is a vertical sectional view on an enlarged scale of a portion of the store taken substantially on the plane of line 3—3 of Figure 1.

Figure 4 is a vertical sectional view on an enlarged scale of a portion of the store taken substantially on the plane of line 4—4 of Figures 1 and 2.

Figure 5 is a vertical sectional view on an enlarged scale of a portion of the store taken substantially on the plane of line 5—5 of Figures 1 and 2.

Figure 6 is a vertical sectional view on an enlarged scale of a portion of the store taken substantially on the plane of line 6—6 of Figure 1.

The store construction of the present invention includes, briefly, one or more merchandise checking stations 11, 12 and 13 to which loaded carts are brought by the patrons after being wheeled about the store and filled with merchandise selected, an empty cart station 14 which is desirably located adjacent to the general entrance way 16 of the store adjacent the entry doors 15, and from which carts may be withdrawn by patrons coming into the store and prior to moving into the merchandise storage area, as here suggested by the end portions of merchandise gondolas 17, 18, 19 and 20 arranged centrally on the floor, and bins and shelving 21 and 22 on the opposite sidewalls 23 and 24 of the store, and conveyor means 26 extending from the checking stations 11—13 to the empty cart station 14 and adapted to receive unloaded carts at the checking stations and to transport and deliver the carts to the empty cart station 14. In accordance with the present invention the system is also extended to include a parking lot station 28, here located in a parking lot area 27 adjoining the exterior side of wall 23 adjacent exit doors 25; conveyor means 29 extending from the several checking stations 11—13 to the parking lot station 28 and being adapted to receive loaded carts at the checking stations for transportation and delivery to the parking lot station 28; and conveyor means 31 extending from the parking lot station 28 to the conveyor 26 and adapted to receive empty carts at the parking lot station for transportation and delivery to the empty cart station 14.

As a feature of the present invention, the several checking stations 11—13 are provided with cart receiving passages 36, 37 and 38, to which loaded carts 39 are brought by the patrons, and with pairs of discharge passages 41 and 42, 43 and 44, and 45 and 46 for the checking stations 11, 12 and 13, respectively. As will be observed from Figure 1, conveyor means 26 is connected by branch conveyors 48, 49 and 50 with the discharge passages 42, 44 and 46 so that empty carts may be fed from each of the checking stations through one of the branch conveyors to conveyor 26 for delivery to the empty cart station 14. Conveyor means 29 is similarly connected by branch conveyors 52, 53 and 54 to the discharge passages 41, 43 and 45 so that loaded carts may be directed from each of the stations 11—13 to the parking lot station 28. In this manner, the person in each of the merchandise checking stations 11—13 has the election of sending either loaded carts to the parking lot station 28 or empty carts to the empty cart station 14, depending upon whether the customer is parked in the adjoining parking lot 27 and wishes to pick up the load in his automobile at station 28, or wishes to carry the merchandise out of the store.

Each of the checking stations 11—13 may be composed of an enclosure defined on one side by a counter 56, on one end (containing the discharge passages) by a contiguous perpendicularly related case 57, on a side opposite and parallel to counter 56 by a low wall 58,

and at the front end opposite and spaced from case 57 and contiguous to wall 58 by a base case 59 for a cash register 61, it being noted that the case 59 is spaced from the forward end of counter 56 so as to provide the cart receiving passages 36—38. In this arrangement the clerk may stand within the enclosure behind the cash register 61 and receive, handle, bag, wrap and otherwise process and check out the merchandise contained in the loaded carts entered through the receiving passage for the enclosure, and following which the clerk may conveniently reload the cart and send it through the appropriate discharge passage to the parking lot station 28, or may remove the contents of the cart and dispatch the empty cart through the appropriate discharge passage to the empty cart station 14.

Preferably, the case 57 is built up above the height of the counter 56, as seen in Figure 2, so that the carts, as illustrated by cart 65, may be passed directly under and through the case 57 by way of an opening 66 therein registering with the interior of the enclosure and with an opening 67 in the floor 68 arranged in registration with the upper end of each of the branch conveyors 48—50, the openings 66 and 67 thus cooperating to provide the discharge passages 42, 44 and 46 aforementioned. The elevated portion of the case 57 may be divided into shelves or compartments 69 for bags and the like.

For most installations it is possible and desirable to effect an under-the-floor installation of the conveyor means connecting the several stations, so that the floor area of the store is left undisturbed. However, as will be understood, the several conveyors may be arranged either on the floor or above the floor, as well as below the floor, where such installations may be required or for some reason preferred. Also preferably and as here shown, the conveyors are in part power-operated and in part gravity-operated. For convenience, the branch conveyors 48, 49 and 50 leaving each of the checking stations may descend therefrom, as viewed in Figure 2, so as to permit a gravity movement of the cart released into the branch conveyor through the discharge opening. The lower ends 71, 72 and 73 of the descending branch conveyors 48, 49 and 50 curve onto a generally perpendicularly related, horizontal power-driven conveyor section 76 forming part of the conveyor means 26.

The section 76 may, as shown in Figure 4, be composed of an endless conveyor belt having a top run 77 supported on a plurality of spaced rollers 78 and entrained around end pulleys 79 and 80, one of which is motor-driven by an electric motor and drive (not shown) so as to drive the top run in the direction of empty cart station 14. A plurality of cleats 86 may be secured to the belt at spaced intervals roughly corresponding to the length of the carts, as indicated by cart 87, so that the cleats 86 will engage the forward wheels of the cart to carry the carts along with the upper run 77 of the belt.

The conveyor 31 leading from the parking lot station 28 is here composed of a downwardly inclined chute having an upper receiving opening 91 in wall 23 of the store building, and a lower discharge end 92 sloping tangentially onto the receiving end 93 of the belt conveyor section 76. The opposite delivery end 96 of the belt conveyor 76 terminates at the upper end 97 of a short connecting chute 98 which connects at its lower end 99 (see Figures 1, 3 and 4) with an elevating conveyor 101 which functions to carry empty carts, as depicted by cart 102, to the empty cart station 14. Conveyor 101 may be composed, as in the case of conveyor 76, of an endless belt having a top run 103 supported on a plurality of rollers 104 and entrained around end pulleys 106 and 107, one of which is power-driven by motive means (not shown) so as to drive the top run 103 in an upward direction from the lower receiving end 108 of the belt adjacent the end 99 of the chute to the upper delivery end 109 of the belt at the floor 68. Similarly, the belt is fitted with cleats 111 which engage the wheels of the cart 102 to be elevated by the belt. The floor 68 may be provided with a downwardly inclined ramp 112 at the upper end 109 of the belt so that empty carts delivered from the top of the belt onto the ramp 112 will roll by gravity to the empty cart station 14.

As here shown (see Figure 6), the several branch conveyors 52, 53 and 54 are each composed of a downwardly inclined chute 116 registering at its upper end 117 with the discharge passage 41, 43 or 45, provided in the raised case 57, and terminating at its lower end in curved portions 118, 119 and 120 leading onto a generally perpendicularly related power-driven belt conveyor section 122 forming part of the conveyor means 29 leading to the parking lot station 28. The conveyor 122 here generally parallels conveyor 76 but is located at a different elevation, as seen in Figures 2 and 6. Conveyor 122 is here composed of an endless belt (see Figure 5) having a top run 123 supported on a plurality of rollers 124 and entrained about end pulleys 126 and 127, one of which is power-driven to cause the upper run 123 to move past the ends 118—120 of the chutes 52—54 to the parking lot station 28. As will be seen in Figure 5, the belt is provided with a plurality of cleats 131 for carrying the loaded carts, as depicted by cart 132, along the top run 123 to the parking lot station 28. As will also be observed in Figure 5, the discharge end of the conveyor 122 extends upwardly to a discharge opening 134 in wall 23 so as to deliver the loaded carts exteriorly of the building.

Since a plurality of branch conveyor lines are used to feed into a main conveyor, as in the case of conveyors 26 and 29 leading to the empty cart station 14 and the parking lot station 28, means is provided to insure an orderly flow of carts from the branch conveyor lines onto the main conveyors so as to prevent a colliding or piling up of the carts. As shown in Figures 1, 2, 4, 5 and 6, cart holding means 141 is provided in each of the downwardly inclined chutes 48—50 and 52—53, and a plurality of cart trip means 142 are provided along the main conveyors and operatively connected to the holding means 141 so as to effect a release of carts from the several branch conveyors onto the main conveyors only when the main conveyors are open at the point of entry of the branch conveyor. The means 141 here consists of an arm 143 pivoted at 144 to each of the down chutes above noted and having one end 146 arranged to swing up and into the chute so as to engage and hold a cart. The opposite end 147 is connected to an actuator 148, which may be hydraulic or magnetic, so that upon energizing of the actuator 148 the arm end 146 will be swung upwardly into the chute to intercept a cart therein, and when not energized, the arm will swing down so as to permit the free passage of carts through the chute.

Energizing of the actuator 148 is controlled by the trip means 142 (see Figures 1 and 6). The latter may be formed with an inclined plate 149 mounted in the main conveyor passage, pivoted at one end 151 for engagement and displacement of its opposite end 152 by a passing cart. An electric switch 153 is connected to the plate end 152 and operated thereby upon displacement by a cart. Accordingly the presence of a cart in the main conveyor at plate 149 will cause a closing of switch 153 and an energizing of one of the actuators 148 so as to prevent at such moment the passage of a cart through the down chute with which actuator 148 is associated. A plurality of trip means 142 are thus provided at spaced intervals along the main conveyors to control the operations of the several cart holding means in the branch conveyors. For example, cart trip means are provided at locations 157, 158 and 159 along the main conveyor 76 for controlling the cart holding means located in chutes 48—50, respectively. In a similar manner, cart trip means are provided at locations 161 and 162 along the main conveyor 122 for controlling the cart holding means located in chutes 52 and 53.

I claim:

1. In a store having roll-about carts for use by patrons in accumulating merchandise from different parts of the store, a merchandise checking station within said store to which loaded carts are brought by the patrons, an empty cart station within said store from which carts may be withdrawn by the patrons, a parking lot station adjoining said store, and conveyor means extending from said checking station to said empty cart station and to said parking lot station and being adapted to receive carts at said checking station for selective transportation and delivery to said empty cart station and said parking lot station.

2. In a store having roll-about carts for use by patrons in accumulating merchandise from different parts of the store, a merchandise checking station within said store to which loaded carts are brought by the patrons, an empty cart station within said store from which carts may be withdrawn by the patrons, a parking lot station adjoining said store, and conveyor means extending from said checking station to said empty cart station and to said parking lot station and from said parking lot station to said empty cart station and being adapted to receive carts at said checking station for selective transportation and delivery to said empty cart station and said parking lot station and being adapted to receive carts at said parking lot station for transportation and delivery to said empty cart station.

3. In a store having roll-about carts for use by patrons in accumulating merchandise from different parts of the store, a merchandise checking station within said store to which loaded carts are brought by the patrons and including an enclosure having a cart entry opening and a pair of cart discharge openings, an empty cart station within said store from which carts may be withdrawn by the patrons, a parking lot station adjoining said store,

and conveyor means extending from one of said discharge openings at said checking station to said empty cart station and from the other of said discharge openings at said checking station to said parking lot station and being adapted to receive carts at either of said discharge openings for selective transportation and delivery to said empty cart station and said parking lot station.

4. In a store having roll-about carts for use by patrons in accumulating merchandise from different parts of the store, a plurality of merchandise checking stations within said store to which loaded carts are brought by the patrons, an empty cart station within said store from which carts may be withdrawn by the patrons, a parking lot station adjoining said store, a first conveyor adapted to receive and transport said carts to said empty cart station, a second conveyor adapted to receive and transport said carts to said parking lot station, a first plurality of conveyors extending from said checking stations and said parking lot station to said first conveyor and adapted to receive and to transport said carts to said first conveyor, means associated with each of said first plurality of conveyors for holding back the carts thereon and to effect a release of carts onto said first conveyor in one-at-a-time order, a second plurality of conveyors extending from said checking stations to said second conveyor, and means associated with each of said second plurality of conveyors for holding back the carts thereon and to effect a release of carts onto said second conveyor in one-at-a-time order.

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