July 15, 1952 E. S. LEE 2,603,315

SELF-SERVICE SYSTEM FOR SALESROOMS OF STORES

Filed Sept. 2, 1947 3 Sheets-Sheet 1

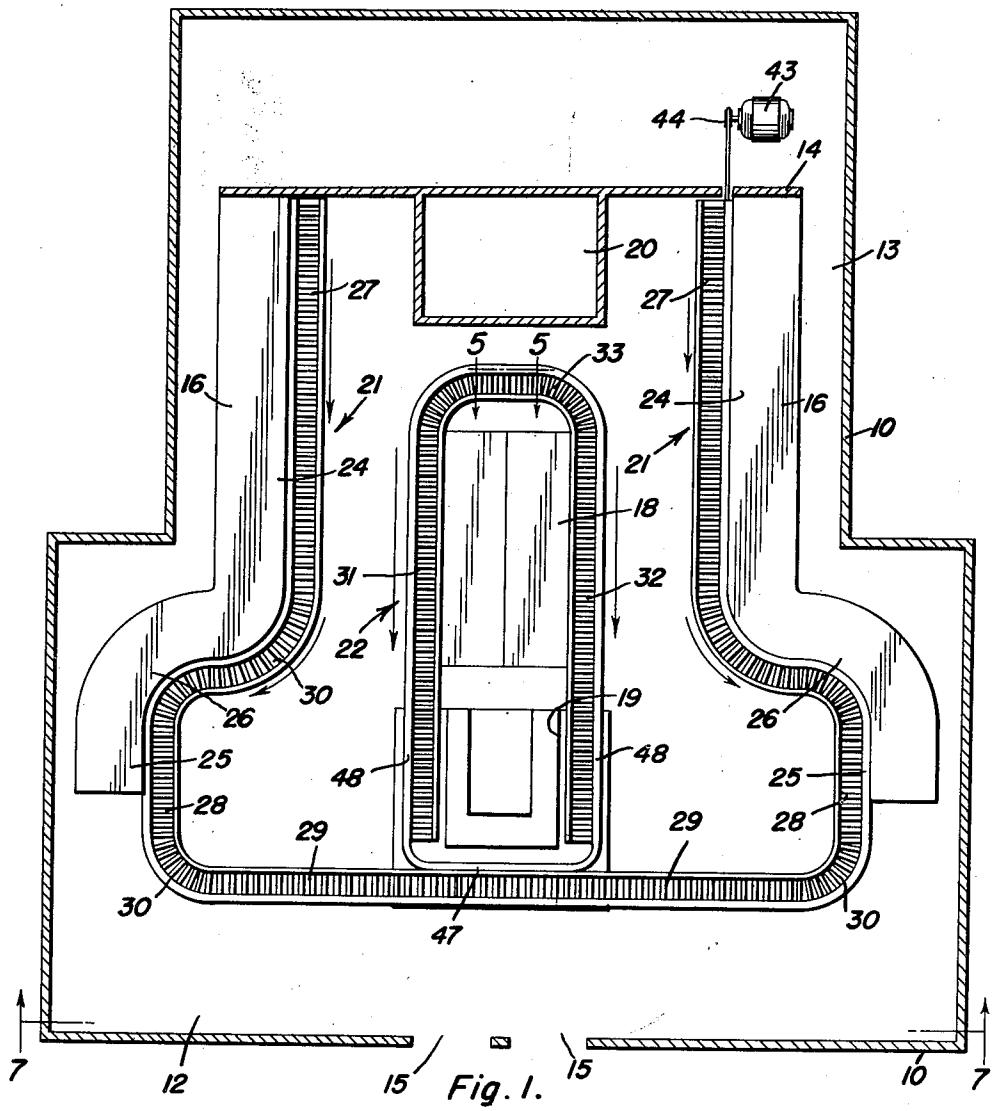


Fig. 1.

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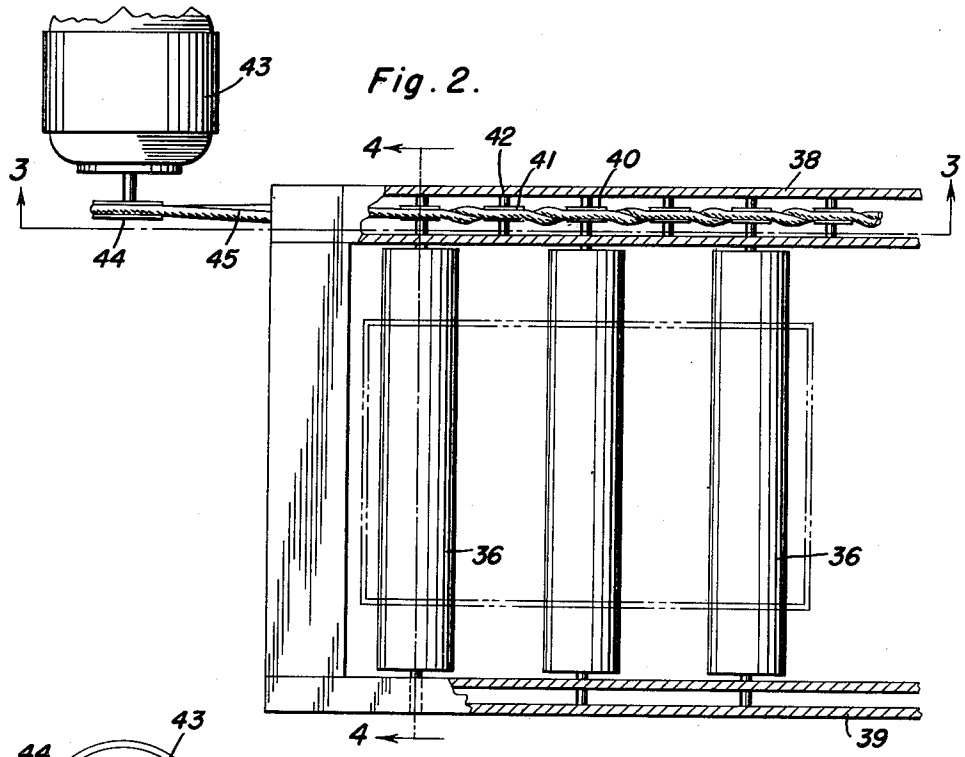


Fig. 2.

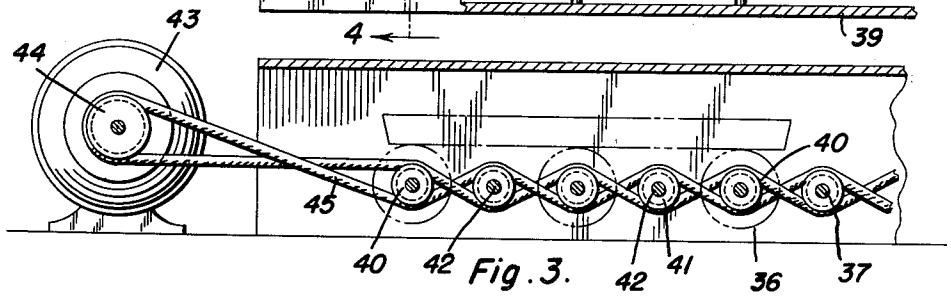


Fig. 3.

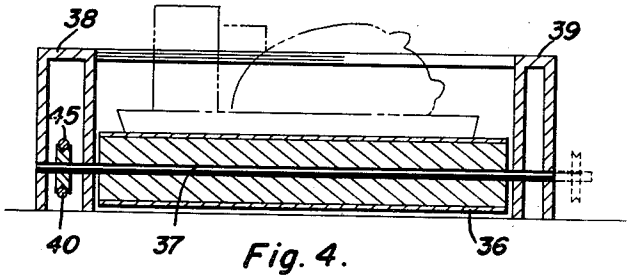


Fig. 4.

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Filed Sept. 2, 1947 3 Sheets-Sheet 3

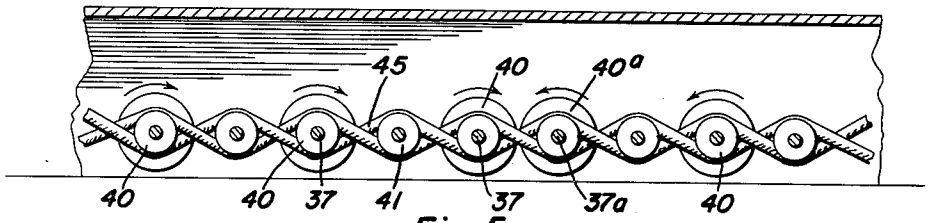


Fig. 5.

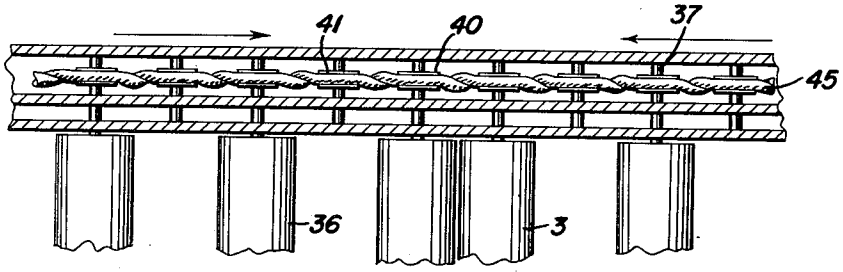


Fig. 6.

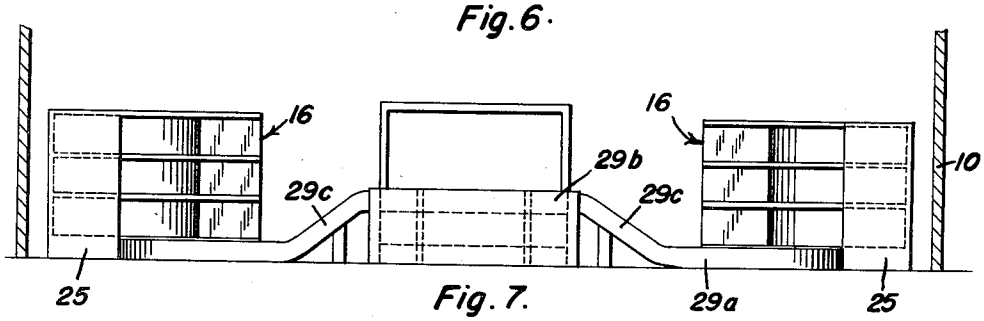


Fig. 7.



Fig. 8.

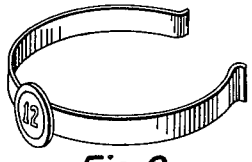


Fig. 9.

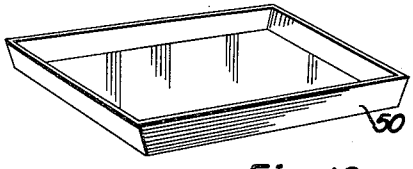


Fig. 10

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UNITED STATES PATENT OFFICE

2,603,315

SELF-SERVICE SYSTEM FOR SALESROOMS OF STORES

Edward S. Lee, Greenville, Tex.

Application September 2, 1947, Serial No. 771,776

2 Claims. (Cl. 186—1)

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This invention relates to self service stores and it has for its object to provide a good collection system by means of which the merchandise selected by the customer and properly identified when selected is automatically conveyed from the shelf where it has been selected to a checker's or attendant's counter, where all the items identified by the same mark or number are collected and held in readiness for the customer or are delivered in accordance with the customer's order.

According to the invention a plurality of conveyors or roller tracks run along the shelves arranged along the walls and further conveyor or roller tracks run around the shelves or close to the sales counters placed in the center of the store and all of these conveyors or roller tracks finally pass around the checker's or attendant's counter. The goods or objects conveyed and properly identified are removed from the conveyor, are collected and put into a tray, basket or the like and are checked, so that the customer may be presented with the tray or with the bag or parcel and with his check already made up when leaving the shop, the sole manipulation to be performed in the presence of the customer being the cashing of the check. This method therefore greatly accelerates the service, and reduces the customer's shopping time and exertion.

Further objects of the invention will be apparent from the following detailed specification.

The invention is illustrated in the accompanying drawings showing one embodiment of the same by way of example. It will however be understood that this example has been selected in order to explain the system according to the invention and does not include a survey of the various modifications to which the system may be subjected. Modifications of the example shown do therefore not necessarily involve a departure from the invention.

In the drawings:

Figure 1 is a diagrammatic plan view of the salesroom of a shop and of the shelves and counters installed, showing the conveyors or roller tracks.

Figure 2 is a plan view of an end portion of a roller track including the driving means for such a track.

Figure 3 is a partly sectional elevational side view along line 3—3 of Figure 2 showing the driving means and the side wall and also showing the rollers and trays in dots and dashes.

Figure 4 is a cross sectional elevational front

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view of the conveyor, the section being taken along line 4—4 of Figure 2.

Figures 5 and 6 are partial views similar to the plan and elevational views shown in Figures 2 and 3 but showing a middle portion of the roller track.

Figure 7 is an elevational, partly sectional front view of the salesroom as shown in Figure 1 as seen from line 7—7 of Figure 1.

Figures 8, 9 and 10 are isometric views of the marking means and of the tray respectively.

The system in general will be explained in connection with Figures 1 and 7 showing a self service store for grocery goods by way of example. The configuration of the room shown in Figure 1 has been selected, partly because this is a typical configuration, but mainly because this configuration presents the greatest difficulties for automatic conveyors which are overcome by the present invention.

The room is enclosed by walls 10 and includes a frontal room section 12 of greater width than the back section 13. The latter section is divided by a partition wall 14 behind which the necessary manipulations may be carried out. The frontal room section 12 is provided with doors 15. The shelves 16 on which the goods are stored are arranged along the walls and may be provided with a section fanning out into the large frontal room section so as to utilize the full width of this section. Further shelves 18 are arranged in the center and adjacent to this central shelf section is the section 19 for the attendants or checkers.

A sales counter 20 may be provided where those goods which require manipulation, such as cutting, dressing, exact weighing or the like, may be delivered.

Conveyors 21, 22 are running along the shelves and sales counters either on or near the floor or at any convenient height. In the example shown conveyors 21 are placed in front of the shelves for the sake of a clearer showing, but it will be understood that they may occupy the front section of one of the shelves, so that the customer need not be separated from the other shelves by the conveyor.

A second conveyor 22 runs along the central shelves 18 and may pass near the sales counter so that the customers may place goods purchased at said counter directly on this conveyor without having to carry them. The same method of placing the conveyor at a small distance may also be used in connection with shelves which cannot be provided with conveyors running im-

mediately in front of them, as above described.

The conveyor may be a belt conveyor, if merely straight conveyor sections are necessary. However, where the conveyor has to include curved sections, a roller track is preferable.

In the example shown the lateral shelves **16** have straight parallel sections **24, 25** which are staggered or spaced and are joined by an intermediate section **26**, shown as curved. The shelf sections are arranged at about equal distances from the walls in adjoining room sections of different width. The lateral conveyor, therefore, is so arranged that it follows the contour of the shelves. It therefore comprises straight sections **27, 28, 29**, joined by curved sections **30**. These sections **29** run continuously up to the checker's or packer's table **19**. The conveyor sections from the two sides of the room may meet at said table and may be joined so as to form a continuous line.

In addition the central shelves **18**, comprising merely straight sections in the example shown, may each be provided with a conveyor **31, 32** running directly to the checker's table or stand **19**. A curved and short straight conveyor section **33** may be provided in addition extending in front of the sales counter **20**, so as to enable the customers to place the merchandise delivered at the counter on the conveyor for collection at the checker's table **19**.

The roller track may be arranged at different horizontal levels **29***a*, **29***b* as shown in Figure 7 and may therefore run on or below the floor at one place and in convenient height for manipulation at other places, with inclined or ramp sections **29***c* between the horizontal sections. The inclined or ramp sections **29***c* if straight, may be sections with a continuously travelling web or belt, if necessary, or they may be simple roller track sections of the type illustrated.

The roller tracks which form a continuous line such as the tracks **21** of both sides, converging at the checker's table **19** or the two central roller tracks **22**, whether driven in the same or in opposite directions, may be driven by a single motor **43**, although as a matter of course, a plurality of motors may be used if more convenient.

Each roller track consists of a number of rollers **36** (Figures 2–6) mounted on axles **37** journaled within two lateral guide walls **38, 39** formed by U-shaped or hollow sheet iron runners. One of the guide walls **38** is of sufficient width to accommodate the driving pulleys **40** in its interior. Between two driving pulleys an idle pulley **41** is arranged on a short axle **42** which is journaled within the hollow guide wall **38**. The pulleys are driven by a motor **43** with a driving pulley **44** by means of an endless cable, cord or belt **45** which runs over all the pulleys **40** and **41**, but whose strands are crossed when passing from a driving pulley **40** to an idle pulley **41** and vice versa. The driving pulleys are therefore all running in the same direction while the idle pulleys run in the opposite direction. The proper frictional tension is permanently upheld by this arrangement so that practically no periodic readjustment of the belt, cord or cable is necessary. If part of the roller track should run in one direction and part of it in the opposite direction, the location of the idle and driving pulleys is exchanged as shown in Figure 5. Two driving pulleys **40, 40***a* with roller carrying axles **37, 37***a* are placed in close proximity to each other so that the direction of rotation in these pulleys is reversed by the crossings of the strands. Behind these two pulleys the driving and idle pulleys **40, 41** are again arranged in the original order and therefore two roller tracks, are formed for transport in opposite directions towards the same point. Such a point is for instance the middle of the collection and checking table or a packer's stand or the like.

The roller track **22** may be driven by a separate motor, but if it is of advantage to drive all the rollers of the various tracks from a single point the roller track **22** may be driven by means of a number of pulleys and rollers arranged in the housing **47** which is merely a continuation of the guide wall **48** of roller track **22**. A number of axles **37** of roller track **21** may project beyond housing **39** (as indicated in dotted lines in Figure 4 and pulleys may be mounted on them. These pulleys are then joined to the other pulleys and idle rollers of the track in the manner illustrated in Figure 5).

The purchased merchandise is put into trays or cradles **50** (Figure 10) which are placed on the roller track and are conveyed toward the checker's table **19**. Where continuous belts are used each individual unit before being placed on the belt is provided with a mark such as a bead or disk carrying a number or the like. This number may be applied to the merchandise itself as shown in Figure 9 by means of an elastic band or some other means for temporary fixation. The customer is presented with a master token bearing the same number which he retains for claiming the selected goods at the checker's table or for ordering the delivery.

Where roller tracks and trays are used as shown in the figures, marked disks may be placed into the trays and others may be used as master tokens.

The arrangement may also be used in self service restaurants and other places, where a customer buys a number of various items which have to be collected by himself and carried or pushed along a runway to the checking counter.

The main advantage of the system consists in the rapidity with which customers may be served, as the time during which they are shopping and selecting the merchandise is utilizable for collecting the items purchased. The final manipulation of checking the items purchased and cashing the money is therefore appreciably shortened and may even be reduced to the latter manipulation if proper organizational measures are introduced.

It will be readily understood that the specific construction of the conveying means may undergo changes without departing from the essence of the invention.

Having described the invention, what is claimed as new is:

1. In a self service system for the salesroom of a store including lateral storing shelves arranged in continuous lines along the walls of the salesroom, further storing shelves arranged along continuous lines near the central portion of the salesroom, and a collecting and checking table, located near the central portion of the salesroom; the improvement of which comprises a power operated conveyor comprising continuous unidirectional roller tracks with straight and curved sections running along and in front of the lateral storing shelves, each unidirectional roller track comprising a number of transportation rollers running in the same direction and driving pulleys connected with said rollers, each of said roller tracks running in a direction providing transportation towards said collecting and checking table,

idle pulleys between said driving pulleys, a single driving motor for a plurality of roller tracks operating in opposite directions with a continuous pulley traction member running over said pulleys and idle pulleys mounted on different sections of the roller track for driving in different directions, centrally located roller tracks running along the centrally located shelves and driving means for said centrally located roller tracks, comprising driving pulleys and idle pulleys arranged alongside the driving pulleys of the other tracks and means for mechanically joining the first named driving pulleys with the last named pulleys.

2. A power operated conveyor comprising a first group of spaced parallel rotatable members including a first end member, a second group of spaced parallel rotatable members including a second end member disposed adjacent and parallel to the first end member, driving pulleys carried by each of said rotatable members of both groups, idle pulleys disposed between and alternating with the driving pulleys of the first group, further idle pulleys disposed between and alternating with the driving pulleys of the second

group, an endless belt trained over all of said pulleys and having upper and lower flights, the upper and lower flights of said belt being crossed when passing from a driving pulley to an idler pulley and from an idler pulley to a driving pulley, said flights also crossing between the driving pulleys on the first and second end members for rotation of the first group of members in an opposite direction to the directional rotation of the second group of members, and means for driving said belt.

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