

[54] **METHOD AND APPARATUS FOR CODED, SELF-SERVICE TRANSFER OF ARTICLES**

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Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 299,951, Oct. 24, 1972, Pat. No. 3,840,103.

[52] U.S. Cl. **221/1; 186/14; 198/38; 214/1 BD; 221/195; 221/255; 235/61.11 R**

[51] Int. Cl.² **G07F 11/58**

[58] Field of Search **214/8.5 K, 1 BD; 198/20 R, 198/21, 26, 38; 186/14, 16; 221/79, 224, 221/225, 236, 255, 312 A, 195, 1; 194/4 R, 10; 235/61.11 D, 235/61.11 E, 61.11 R**

[56] **References Cited**

UNITED STATES PATENTS

2,851,165 9/1958 Schreyer et al. 211/1.5

2,997,133 8/1961 Gehrke 194/4 R X
3,785,474 1/1974 Nakamoto 198/38
3,840,103 10/1974 Willis 194/4 R

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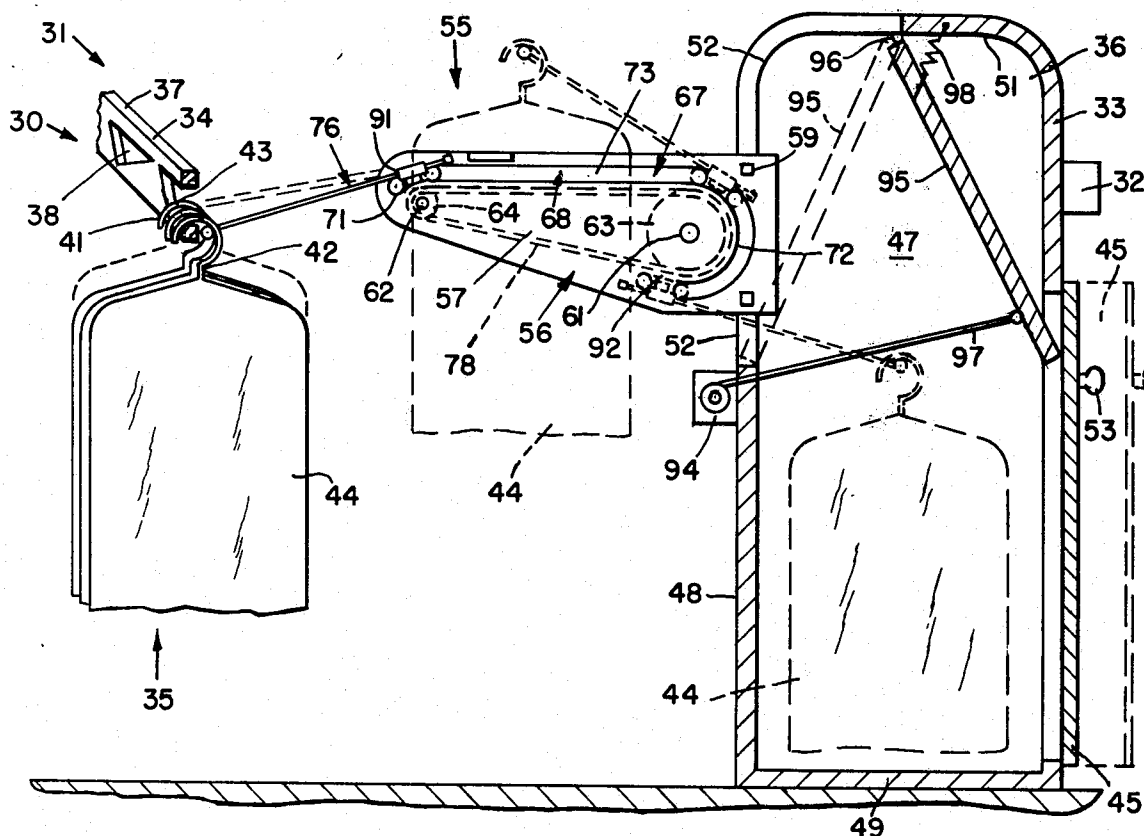
Attorney, Agent, or Firm—Pearson & Pearson

[57]

ABSTRACT

A self service dispenser for dry cleaned garments, operable day and night, is actuated by a coded card of the customer, from outside the establishment, to move the customer's wire coat hanger supported garments to a transfer station. A hooked arm, pivotally mounted on a carriage movable on a track support, then hooks under the set of hangers, lifts them off the conveyor and bodily transports them in one continuous movement away from the conveyor and over into the locked compartment. The garments may hang downwardly in a high narrow compartment, or be laid flat on the floor of a low wide compartment.

10 Claims, 6 Drawing Figures



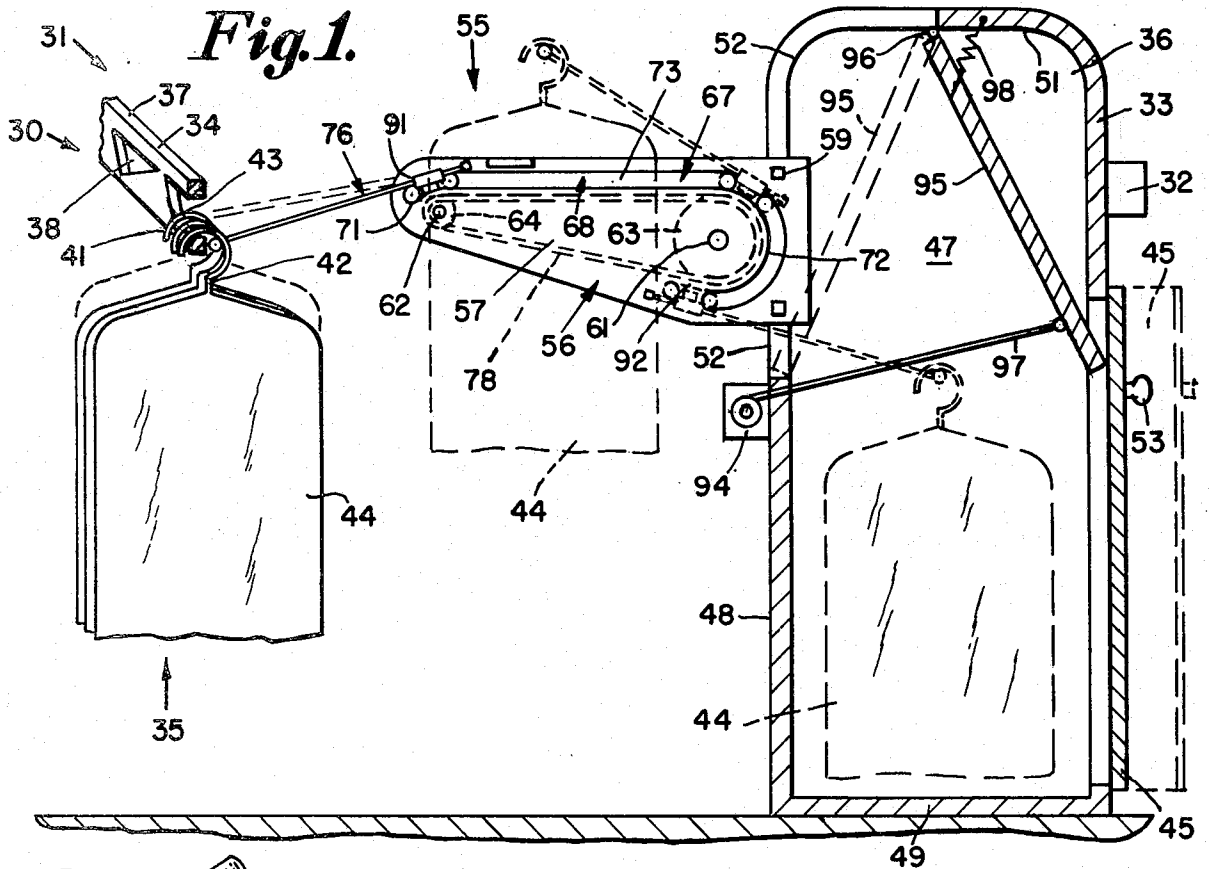
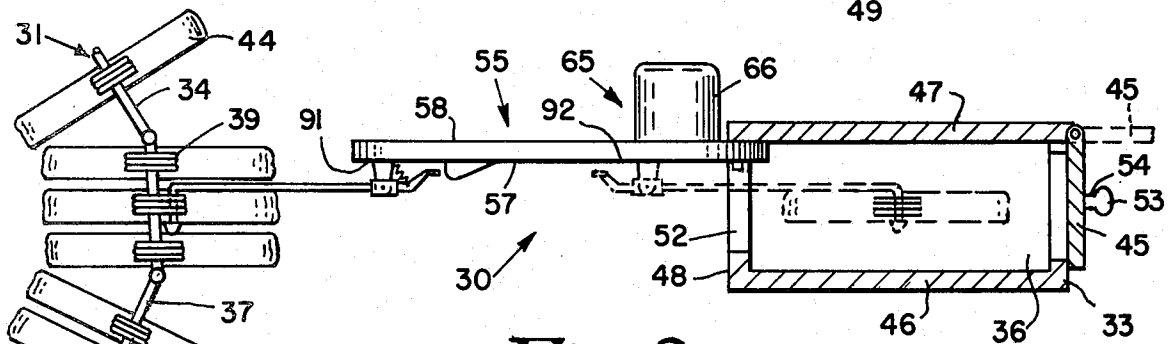
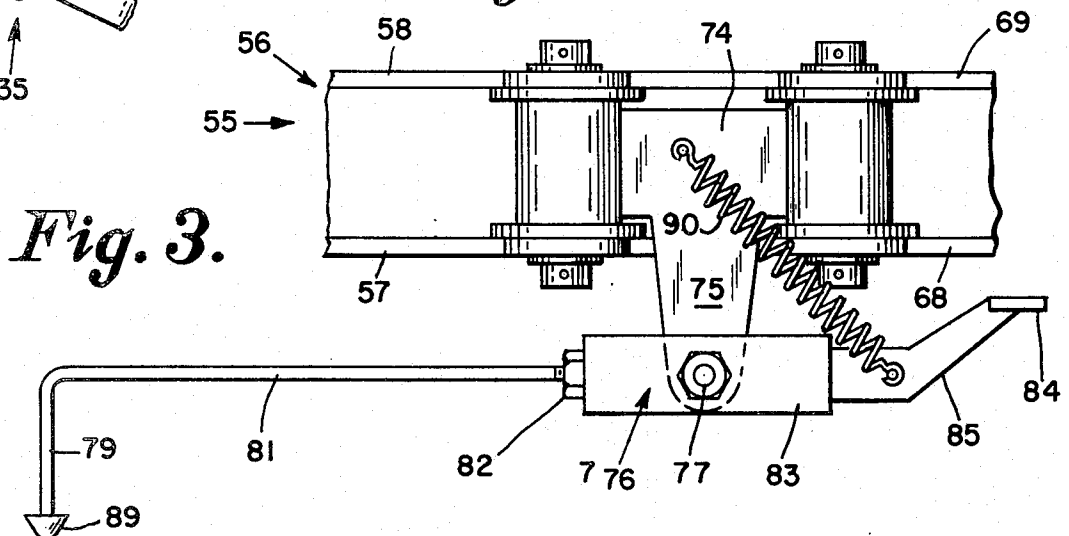


Fig. 4.

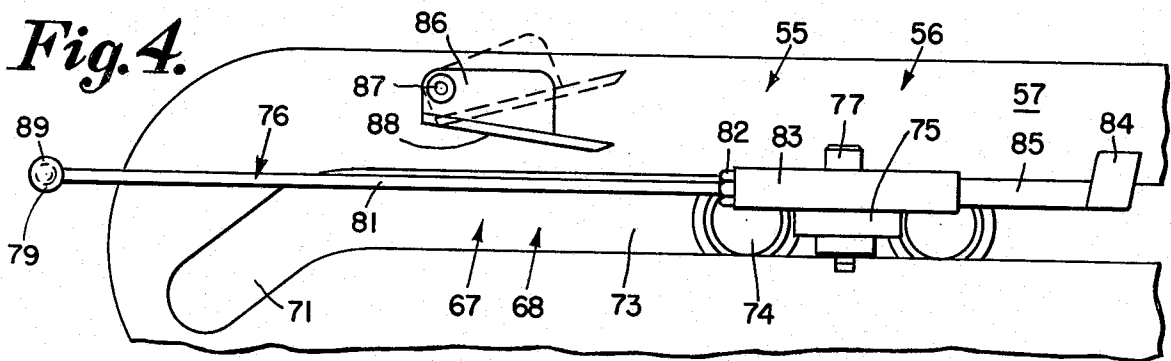
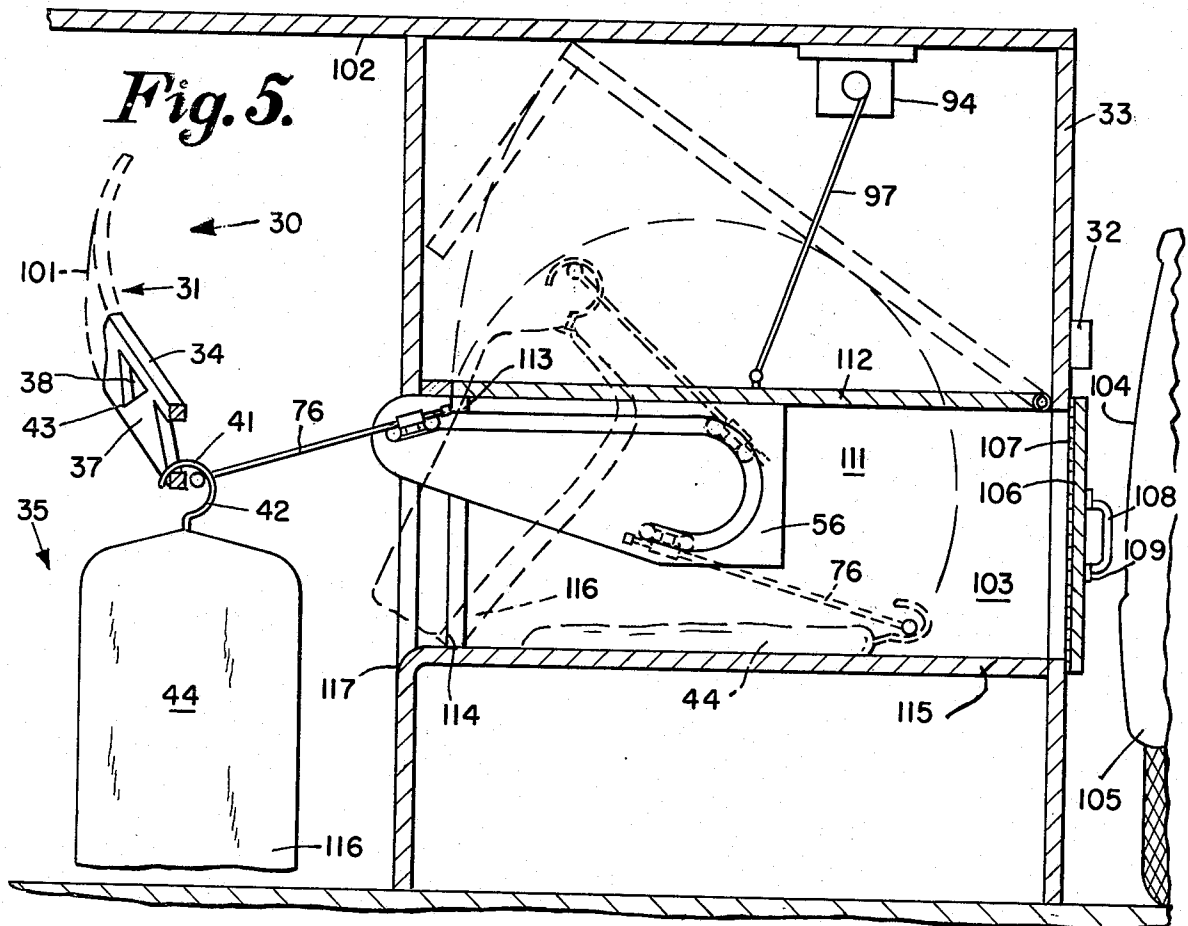
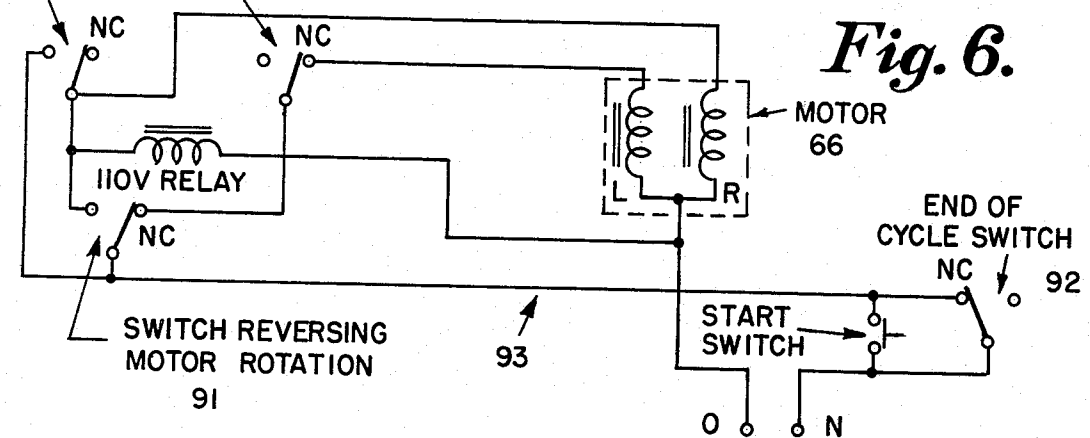


Fig. 5.



RELAY CONTACTS



METHOD AND APPARATUS FOR CODED, SELF-SERVICE TRANSFER OF ARTICLES

RELATED APPLICATION

This application is a continuation in part of the application of Irving Willis, Ser. No. 299,951, filed Oct. 24, 1972 now U.S. Pat. No. 3,840,103 of Oct. 8, 1974.

BACKGROUND OF THE INVENTION

It has heretofore been proposed to provide transfer means at one or more transfer stations along the path of a conveyor whereby hanger supported garments may be transferred away from the conveyor to a work or treatment zone.

In one type transfer means the garments are carried parallel to the path of the conveyor, rather than closely packed front to back, and while this takes up valuable floor space it is relatively easy to drop off the hangers onto a track to fall by gravity to the destination. Typical thereof are U.S. Pat. 2,993,584 Winz of 1961, 3,151,730 to Bunten of 1964, 3,163,283 to Kuwertz of 1964, 3,785,474 to Nakamoto of 1974 and 2,997,133 to Gehrke of Aug. 22, 1961. In addition to being parallel to the path of the conveyor, in the Gehrke device special hooks must be used on the conveyor.

In another type transfer means the garments are carried transverse to the path of the conveyor, closely packed and front to back but low cost, conventional, wire hangers can not be used and instead a special set of hangers are provided as in U.S. Pat. 3,379,295 to Varley of Apr. 23, 1968. In most devices of this type the hangers are shifted from one apparatus to another, thereby risking loss of control, inadvertent dropping, etc., for example, as in the said Varley patent and U.S. Pat. No. 3,194,383 to Kuwertz of 1965.

In still another type transfer device the garments are transverse to the path of the conveyor and a transfer arm is used to lift off the hangers but the arm might tend to pick up adjacent hangers also unless the clusters, or sets, of hangers were widely spaced apart and the conveyor must continue moving during transfer to effectuate the transfer. U.S. Pat. Nos. 3,194,383 to Kuwertz and 3,207,262 to Berman exemplify this type.

All of the above prior art patents thus fail to provide a low cost, rugged solution to the problem of accurate, foolproof, transfer of a set of wire coat hangers from a halted conveyor into a locked compartment for the reason that they either shift the hangers from one track or arm to another, or carry the garments end to end, or require special hangers, hooks, tracks, guides or the like.

SUMMARY OF THIS INVENTION

As suggested in the above mentioned co-pending patent application Ser. No. 299,951 now U.S. Pat. No. 3,840,103 of Irving Willis, the transfer apparatus may comprise an automatic powered arm, or linkage arranged at the transfer station to grip a set of garment hangers halted at the station and bodily transport the same over into the compartment, the compartment being wide and shallow and an inner door forming a rear wall thereto.

This application is drawn to a specific embodiment of such an apparatus wherein the conveyor is halted at the transfer station and the garments are depending from conventional wire coat hangers in front-to-back, closely packed, association to extend transversely of the path.

An elongated support extends from the locked compartment to the halted conveyor, the support having a track with a compound curve in a vertical plane, and a carriage movable therealong, the carriage having an elongated hooked arm projecting therefrom and arranged to pivot in a horizontal plane on the carriage. Each link of the conveyor preferably consists of a plate having three or four triangular apertures or notches, so that a set, or cluster, of wire hangers gather in the triangular notch for ready "lift off". The hooked arm has an enlarged terminal tip on the hooked end to prevent fall off of the hanger hooks.

Upon signal from the coded control a power means such as a reversible electric motor, independent of the halted conveyor, moves the carriage and hooked arm rearwardly toward the notch containing the desired hanger set whereupon a pivoted cam pivots the moving arm horizontally so that the hooked end engages side-wise under the hooks of the hangers. The carriage rides in a curved track in the support, and is caused to rise to lift off the hangers by the curve, then to move away from the conveyor and downwardly into the locked compartment as the hooked arm describes a curved path in a vertical plane while continuously supporting the hangers.

A rear door then closes the back of the compartment, as the front door opens, to give access to the garments by the customer. Garments may be placed on the hooked arm for return to the conveyor in a similar manner. By lowering the level of the conveyor and providing a raised floor to a wide shallow compartment, the apparatus will twist the garments on the hooked arm by contact with the floor and the garments are then laid down on the floor for access by an automobile type "drive-in" compartment, at the level of the vehicle windows.

The cluster of wire coat hangers, once engaged by the hook of the transfer arm, is never shifted, or released, but is always under positive control so as to avoid the malfunctioning of prior devices, one such failure to engage, dropping of garments, tearing of garments, etc. making such an apparatus commercially unacceptable as a self service unit.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevational view of the transfer apparatus of the invention with parts broken away.

FIG. 2 is a plan view of the apparatus shown in FIG. 1 with parts broken away.

FIG. 3 is an enlarged plan view of the carriage and pivoted hooked arm.

FIG. 4 is a side elevational view of the device shown in FIG. 3.

FIG. 5 is a diagrammatic side elevation similar to FIG. 1, showing the apparatus used in a wide shallow drive in compartment with the garments laid flat and

FIG. 6 is a circuit diagram of the invention.

DESCRIPTION OF PREFERRED EMBODIMENT

As shown in FIG. 1, the endless conveyor 30 is illustrated only diagrammatically because it is well known as a part of an automatic-self-service garment dispenser 31 such as fully disclosed in U.S. Pat. No. 3,379,295 to Varley or U.S. Pat. No. 3,840,103 to Willis. In such devices a customer has a coded card for insertion in control 32 on the exterior of a wall, or kiosk 33, the control then signalling the conveyor 30 to move the link 34, carrying the customer's garments up to a halt at the

transfer station 35, opposite the garment transfer compartment 36. The endless conveyor 30 may extend through one or two floors of a dry cleaning establishment, or department of a hospital, and in this invention each link 34 is about twelve inches long, slightly curved and comprises a plate 37 with four inverted triangular apertures, or notches 38, so that a set, or cluster 39, of the hooks 41 of conventional, low cost wire coat hangers 42 will gather in a compact group in the apex, or trough 43 of a triangular notch 38.

The hangers 42 are carried on conveyor 31 with the garments 44 depending therefrom in front-to-back, closely packed arrangement and transverse to the path of the conveyor so that undue floor space is not used. In this invention the garment transfer compartment 36, is immovable, free of the revolving drum apparatus of the prior art, and the front wall 33 is relatively high and narrow, with a high, narrow hinged front door 45, opposite side walls 46 and 47, a rear wall 48, a floor 49 and a top wall 51, there being a slot 52 in the rear wall. The garments 44 are bodily transported in one continuous movement in the plane of the garments, edge first, from the conveyor 31 into the compartment 36 by the garment transfer means 55 of the invention. The door 45 is provided with a knob or handle 53 and an automatically operated lock 54, the lock opening in response to a signal from code control 32 in a known manner.

Garment transfer means 55 includes an elongated support 56, preferably formed by a pair of parallel plates 57 and 58, extending in vertical planes from proximate the conveyor 31 to proximate the compartment 36 and supported by bolts 59 on rear wall 48. Journalled on shafts 61 and 62 within support 56, and extending between plates 57 and 58 are a large drive sprocket 63 and a small sprocket 64, the large sprocket 63 being driven by power means 65, independent of conveyor 31, and formed by a reversible electric motor 66, supported on plate 58.

An elongated, compound curved track means 67, comprising a pair of identical oppositely disposed arcuate slots 68 and 69, each in a plate 57 or 58, extends in a vertical plane in support 56 with a short forward downcurved portion 71 proximate the conveyor 31 and a partly circular reverse curved portion 72 proximate compartment 36, separated by the straight portion 73. A wheeled carriage 74 is guided and supported in the slots 68 and 69, the carriage 74 having a bracket 75 extending out from the slot 68 to which a hooked transfer arm 76 is pivoted at 77 to move only in a horizontal plane. The carriage 74 is fixed to the endless chain 78, trained around sprockets 63 and 64, so that the reversible motor 66, under the control of the limit switches shown in FIG. 6, moves the carriage, pivoted arm and any garments thereon, back and forth between the conveyor and the compartment.

The elongated hooked transfer arm 76 includes a free terminal hook 79, a shaft 81, which is adjustable in length by nut 82 in body 83, and includes an upstanding cam follower 84 at the tail portion 85 on the other side of the pivot from hook 79. The hooked end 79 is called the forward end and the cam follower end 84 is called the rearward end for convenience.

A cam 86 is pivoted at 87 to the plate 57 of support 56, and includes a curved cam face 88 extending in a horizontal plane in the path of follower 84. As the horizontal hook 79 of arm 76 approaches the cluster of hooks 41 of the set of hangers 42, which have been

halted at transfer station 35, the cam 86 is engaged by follower 84 and pivots the hook 79 horizontally, or laterally to pass by the hooks in the apex 43 and then spring back to normal position by reason of spring 90 to hook under the cluster of hangers. At this time the hooked arm is inclined downwardly because carriage 74 is in the downwardly inclined short portion 71 of the slots 68 and 69. The carriage having reached the end of its path and the wire hangers having been received on the hook 79, over the tapered, terminal, enlarged tip 89, the limit switch 91 signals the motor 66 to retract the carriage, thereby lifting the hooks 41 off the conveyor and out of the apex 43.

The carriage then moves rearwardly along the straight slot portion 73 with the garments depending from the hook 79 of arm 76 and continues to move around the partly circular, reverse curved portion 72 until it trips limit switch 92 and halts with the garments having passed through slot 52 in rear wall 48 and stationary in compartment 36.

The circuit 93 under the control of code control 32 then opens the lock 54 of front door 45 after first energizing a second motor 94 to close a rear door 95, pivoted at 96, by means of the connection 97 and against the bias of spring 98. The cam 86 pivots out of the way of the cam follower 84 as the arm travels toward the compartment 36.

An automobile drive-in type transfer apparatus is illustrated in FIG. 5 wherein the conveyor 31 is at a reduced height and may have a section 101 leading down from the floor 102 above. Instead of a high, narrow, compartment 36, the compartment 103 is at the level of the window 104 of a vehicle 105, to enable the driver to actuate control 32 with his magnetic card, or other code device, and obtain his garments while still remaining seated in his car. Thus the compartment 103 is low and wide with a low wide front door 106 hinged at 107 and having a handle 108 and an automatic lock 109 similar to lock 54. Compartment 103 includes side walls 111, a top wall 112 with an integral rear wall 113, the rear wall having a slot 114 for support 56, and a floor 115 which is at a raised height. The combined top and rear wall is raised out of the way of the transfer arm by a motor 94 and connection 97, by control circuit 93 and drops into position by gravity before the lock 109 is automatically opened.

By reason of the configuration of the hook 79 of arm 76, the hooks 41 of the clusters of wire coat hangers 42 are so carried as to be free to twist nearly through 90° as the lower portion 116 of the garments 44 strikes the forward portion 117 of the raised floor 102. The garments are thus turned from an endwise position transverse to the path of the conveyor to a position substantially parallel thereto as the transfer arm gently lays the garments flatwise in a horizontal position on the floor of the drive-in compartment.

We claim:

1. In a coded, automatic, self service garment dispenser of the type having an endless conveyor carrying a plurality of individual sets of conventional wire coat hanger supported garments spaced therealong in front to back closely spaced relation said conveyor having a garment transfer station with a locked immovable compartment along the path thereof and said dispenser having customer actuated code control mechanism for halting said conveyor with the customer's garments at said station the combination of;

coat hanger transfer means at said station, for bodily transporting a set of said coat hangers, so halted at said station, away from said conveyor and into said locked immovable compartment;

said means including a carriage, track means supporting and guiding said carriage to move in an arcuate path in a vertical plane; an arm having a horizontally extending terminal hook, said arm being pivoted to said carriage to move in a horizontal plane, and cam means, on said support, for pivoting said arm laterally in a horizontal plane to hook sidewise under the hooks of the hangers of said set; and power means, independent of said conveyor, and responsive to a signal from said code control mechanism to actuate said transfer means to move said carriage back and forth between said conveyor and said compartment

whereby the hook of said arm moves horizontally under said hanger hooks, and the vertical arcuate path of said carriage on said track means lifts said hooks up off said conveyor and thence over and down in a vertical plane to the level of said compartment.

2. A garment dispenser as specified in claim 1 wherein:

said track means comprises a pair of parallel, vertical, elongated plates having oppositely disposed curved slots therein and

said carriage includes wheels guided in said slots the ends of said slots proximate said conveyor curving downwardly to create a lift to said hook when said wheeled carriage is moved toward said compartment.

3. A garment dispenser as specified in claim 2 wherein:

said carriage is fixed to a chain trained over sprockets journaled within said parallel plates and said power means includes a reversible electric motor driving one of said sprockets and mounted on one of said plates.

4. A garment dispenser as specified in claim 1 wherein:

said horizontally extending terminal hook includes an enlarged terminal tip for preventing inadvertent release of any wire coat hangers hooked thereover.

5. A garment dispenser as specified in claim 1 wherein:

said locked compartment is relatively high and narrow,

said garment transfer means bodily transports said garments edgewise away from said conveyor and into said compartment

and said compartment includes a relatively high narrow normally closed front door and a relatively high, narrow normally open rear door, both operably connected to move in unison for one to open as the other closes and vice versa.

6. A garment dispenser as specified in claim 1 wherein:

said conveyor at said station is at a reduced height corresponding to the level of an automobile window;

said locked compartment is relatively low and wide and includes a floor at said level adapted to support garments horizontally

and said garment transfer means bodily transports said garments edgewise away from said conveyor

until the lower portion thereof engages said floor to twist said garments for horizontal deposit on said floor.

7. Apparatus for bodily transporting an individual set of garments, depending from conventional wire hangers, between an endless dry cleaning conveyor and a locked compartment alongside said conveyor said apparatus comprising:

a support fixed between said conveyor and said compartment and having a track defining a curve in a vertical plane;

a carriage mounted to move along said support in said curved track;

a hooked arm movably mounted on said carriage to pivot in a horizontal plane; means for moving said hooked arm back and forth in a horizontal plane when the hook of said arm is proximate a set of coat hangers halted on said conveyor to hook under the hooks of said hangers

power means for driving said carriage back and forth in said curved track of said supports and

coded control means for actuating said power means to move said carriage up to said conveyor to permit said hooked arm to lift off said coat hangers and then move said carriage, hooked arm and hangers along said support to deposit said garments in said compartment.

8. The method of transferring dry cleaned garments suspended on conventional wire coat hangers on a halted endless conveyor into a locked immovable self service compartment by means of a track, carriage and pivoted transfer arm which comprises the steps of:

moving said carriage on said track in a compound curved path in a vertical plane, with said arm fixed against vertical movement thereon, up to said conveyor

then, pivoting said arm in a horizontal plane on said carriage to move the hooked terminal end thereof horizontally away from the hangers to be engaged as the carriage comes to a halt

then pivoting said arm in a horizontal plane in the reverse direction to engage the hooked terminal end under the cluster of hooks of said hangers on said conveyor

then moving said carriage in an upwardly inclined direction to lift said hooked end of said arm and thereby lift said hooks off said conveyor for retraction,

and then moving said carriage, arm and garments over to said compartment while describing a compound curve in a vertical plane to deposit the same in said compartment.

9. The method as specified in claim 8 wherein:

the step of moving said garments on said compound curve in said vertical plane includes the step of moving the same in a rectilinear path in said vertical plane.

10. The method as specified in claim 8 plus the steps of:

supporting the hooks of said hangers on the hook of said transfer arm relatively loosely and

intercepting the lower portion of the garments depending from said hangers as they approach said compartment, to thereby cause said garments to twist through substantially 90° and to be laid flatwise on the floor of said compartment.

* * * * *