

[54] APPARATUS FOR SORTING AND
DISTRIBUTING CLOTHING

[76] Inventor: Taro Nakamoto, 945 Joge,
Joge-machi, Konu-gun, Japan

[22] Filed: Jan. 11, 1972

[21] Appl. No.: 216,959

[52] U.S. Cl. 198/38, 211/1.5, 211/122

[51] Int. Cl. B65g 43/00

[58] Field of Search 211/1.5, 121, 122;
198/38

[56] References Cited

UNITED STATES PATENTS

2,946,427 7/1960 Friedman 198/38

FOREIGN PATENTS OR APPLICATIONS

791,276 2/1958 Great Britain 198/38

959,943 6/1964 Great Britain 198/38

1,176,057 8/1964 Germany 198/38

Primary Examiner—Roy D. Frazier
Assistant Examiner—Richard L. Stroup
Attorney—Arthur G. Connolly et al.

[57] ABSTRACT

Apparatus for sorting and distributing clothing on hangers to predetermined locations along path of travel comprises plurality of spaced apart hanger holding devices arranged for movement along path of travel. Arm on each holding device releasably holds clothes hanger thereon. Releasing mechanism is associated with each holding device for releasing clothes hanger from device at predetermined location along path of travel. Another mechanism cooperates with releasing mechanism at each of plurality of predetermined locations along path of travel of holding devices for activating releasing mechanism of particular holding device at predetermined location so that clothes hanger is released from arm of particular holding device when device arrives at predetermined location.

3 Claims, 7 Drawing Figures

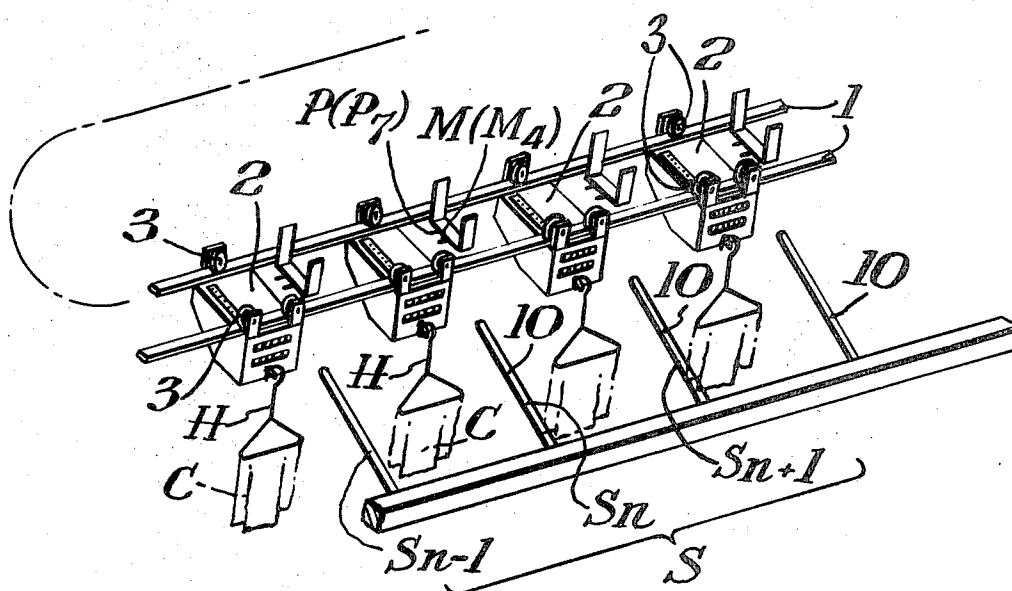


Fig.1.

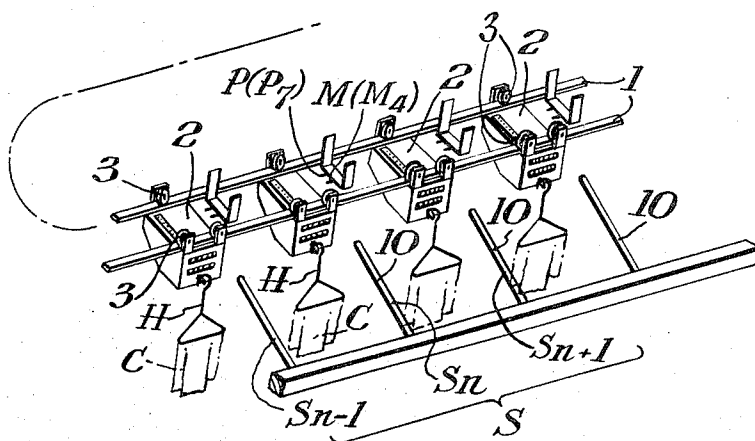
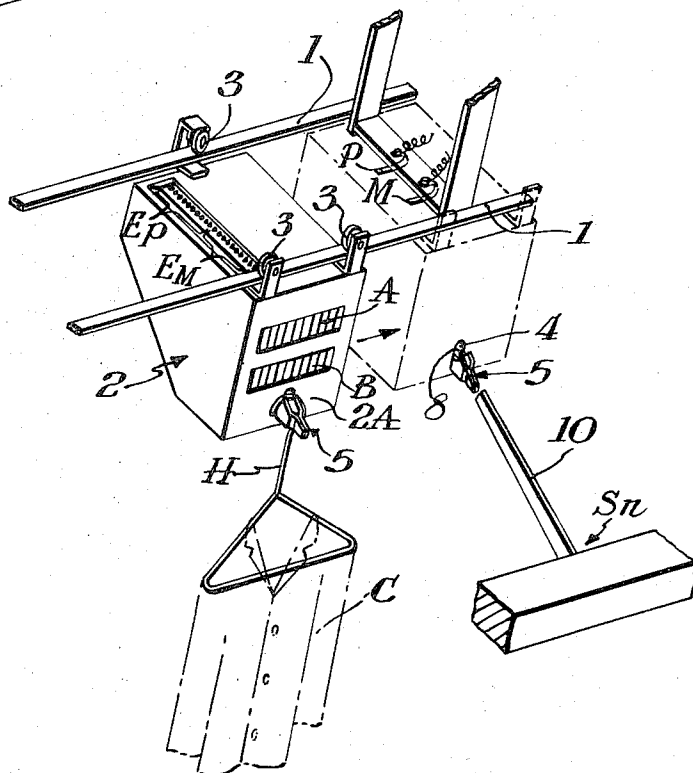


Fig.2.



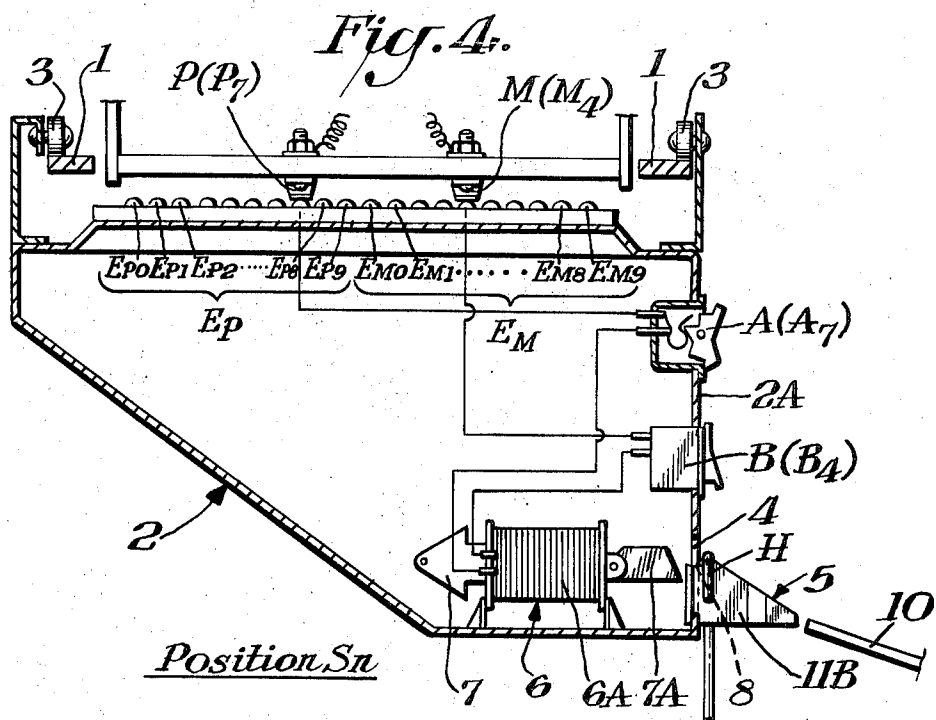
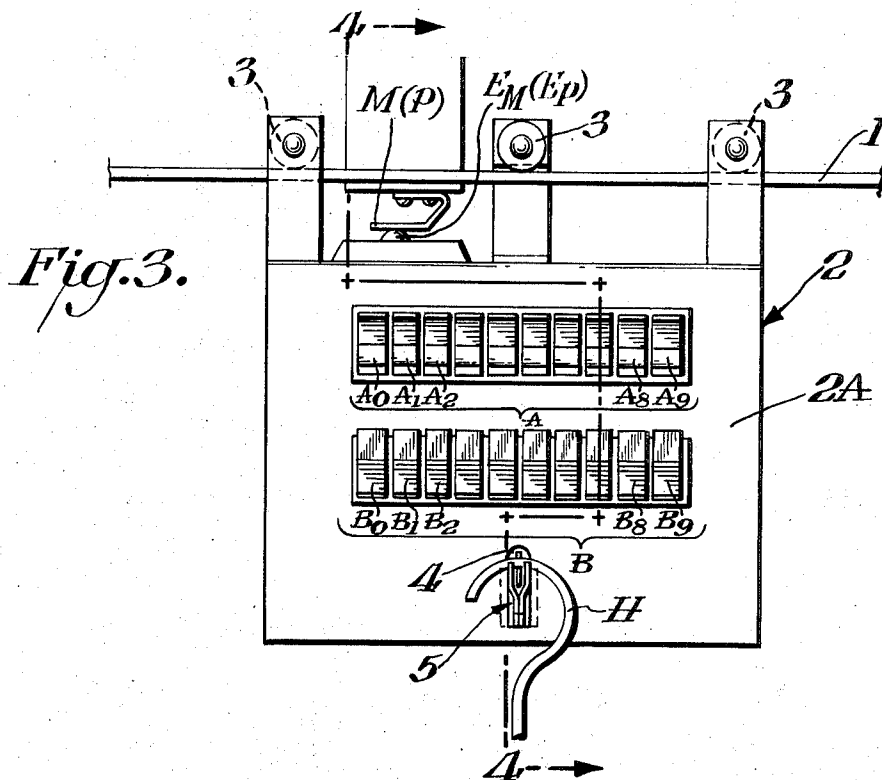


Fig. 5.

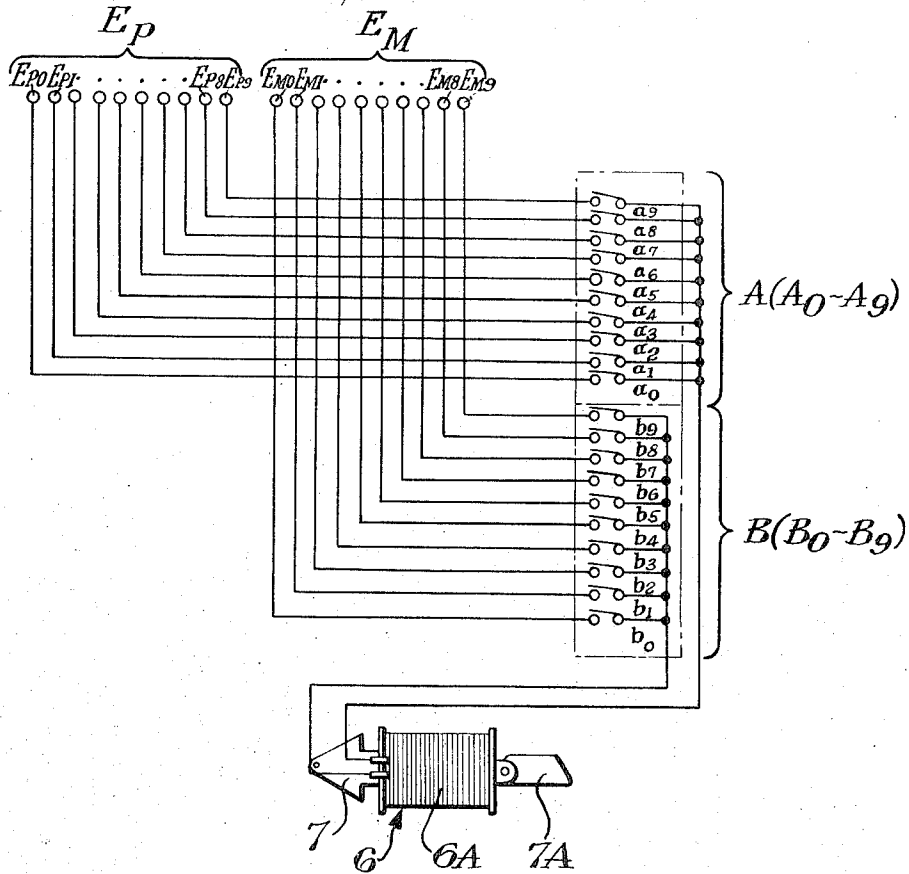


Fig. 6A.

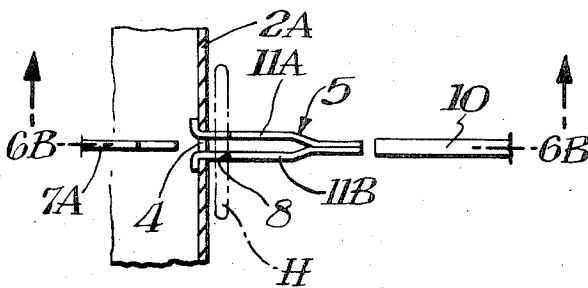
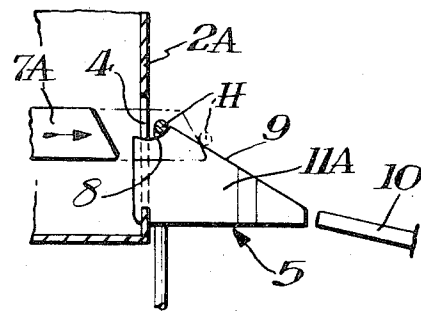


Fig. 6B.



APPARATUS FOR SORTING AND DISTRIBUTING CLOTHING

BACKGROUND OF THE INVENTION

The present invention relates to an apparatus for distributing washed clothes and other cleaned wearables, and more particularly to an apparatus for selecting a predetermined position during the conveyor transport of cleaned clothes on hangers and then distributing the cleaned clothes to the predetermined position.

In handling a large quantity of washed clothes, especially in a laundry, after the clothing is washed and dried, assorting is made according to ownership, distribution centers for return of the clothing, etc. However, heretofore no effective machine has been provided for assorting clothes as required above, and such assorting was only possible through time-consuming manual labor. Clothing hung on clothes hangers makes the assorting job that much more difficult.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention to provide a highly efficient and beneficial apparatus for assorting ownership of the wearables, distribution centers for ultimate return of the clothes to the owners, and other factors.

Another object of the present invention is to provide an apparatus for distributing cleaned clothes to a predetermined location during the transport thereof by a conveyor.

Another object of the present invention is to provide an apparatus for distributing cleaned clothing hung on hangers by releasing the hangers from holding devices mounted on a circulating conveyor when each hanger holder arrives at a predetermined location during the transport thereof by the conveyor.

Still another object of the present invention is to provide a distributor for cleaned clothing which includes a mechanism for releasing clothing hangers from holding devices by the action of an electric current circuit when the holding device arrives at a predetermined location during transport thereof by a conveyor.

In accordance with the present invention an apparatus is provided for sorting and distributing clothing on hangers to predetermined locations along a continuous path of travel. The apparatus comprises a plurality of spaced apart hanger holding devices arranged for movement along the continuous path of travel. Each holding device includes an arm that releasably holds a clothes hanger thereon. A releasing mechanism is associated with each holding device for releasing the clothes hanger from the device at a predetermined location along the continuous path of travel of the device. Another mechanism cooperates with the releasing mechanism at each of a plurality of predetermined locations along the continuous path of travel of the holding devices for activating the releasing mechanism of a particular holding device at a predetermined location. When these conditions occur the clothes hanger is released from the arm of the particular holding device as the device arrives at the predetermined location.

BRIEF DESCRIPTION OF THE DRAWINGS

Novel features and advantages of the present invention in addition to those mentioned above will become apparent to those skilled in the art from a reading of the following detailed description in conjunction with the accompanying drawing wherein:

FIG. 1 is a perspective view of an apparatus according to the present invention;

FIG. 2 is an enlarged partial perspective view of the apparatus of FIG. 1;

FIG. 3 is an enlarged front view of a holder according to the present invention;

FIG. 4 is an enlarged side cross-sectional view of the holder taken along line 4—4 of FIG. 3;

FIG. 5 is an electric schematic of the circuit for releasing the hold of the clothing hangers according to the present invention; and

FIGS. 6A and B are enlarged partial views of the mechanism for releasing the hold of the clothing hangers in which FIG. 6A is a plan view and FIG. 6B is a cross-sectional view taken along line 6B—6B of FIG. 6A.

DETAILED DESCRIPTION OF THE INVENTION

Referring in more particularity to the drawing, FIGS. 1 and 2 illustrate a circular rail 1 mounted to the ceiling of a clothes cleaning plant. Holders 2 are mounted on the rail 1 by pulleys 3. The holders 2 function to hold and release hangers on which cleaned clothes are hung. Each holder 2 is connected in predetermined spaced relationship to an endless chain belt (not shown), and the holders are transported in one direction along the rail 1 by a driving device (not shown).

In FIGS. 3 and 4, the holder 2 is shown in the form of a box, and on the center of the front panel surface 2A electric contact point changing switches A (A_0-A_9) and B (B_0-B_9) are mounted. A longitudinal opening 4 is located at the under portion of the center of the holder 2. A holding arm 5 fixed on the front panel 2A of the holder 2 projects therefrom, as shown best in FIG. 4. On the upper surface of the holder 2 plus terminals E_p ($E_{p0}-E_{p9}$) and minus terminals E_m ($E_{m0}-E_{m9}$) are mounted in a line transverse to the advancing direction of the holder, as shown in FIG. 4. In the inner side of the holder 2 a solenoid type electromagnet 6 is mounted. The electromagnet 6 has a plunger 7 with a head 7A that extends through the opening 4 in the front surface panel 2A of the holder.

FIG. 5 illustrates an electrical schematic diagram of the connections among the terminals E_p and E_m , switches A and B, and the electromagnet 6. The plus and minus terminals E_p and E_m are connected to the correspondingly numbered switches A and B. Each contact point of the switches A and B is connected in parallel to the coil 6A of the electromagnet 6.

Returning now to FIG. 4, this figure shows a typical embodiment of an electric circuit which supplies an electric current to the electromagnet 6 via terminals E_{p7} , E_{m4} and switches A_7 , B_4 in the electric circuits. The terminals E_{p7} , E_{m4} are connected to a power source and electric current is supplied to the electromagnet 6 when the contact points a_7 , b_4 of the switches A_7 , B_4 are closed to thereby energize the electromagnet 6. As a supplying means of electric current, a pair of contact plates P and M are set between the rails 1. These plates function as plus and minus terminals and are connected

to an outer power circuit. At the predetermined locations where the cleaned clothes are distributed, the space between the pairs of contact plates P and M at these locations is regulated so that the contact plates P and M contact any one of the terminals E_p (E_{p0} - E_{p9}) and any one of the terminals E_M (E_{M0} - E_{M9}) of the holders 2. Accordingly, in the illustrated embodiment numerous positions of distribution for the clothes are available along the path of travel of the holders 2. Since any pair may be selected between ten terminals E_{p0} - E_{p9} and ten terminals E_{M0} - E_{M9} , respectively, there are one hundred combinations.

Still referring to FIG. 4, an example is described below for distributing clean clothes to position S_n in FIG. 1 with the clothes on the holder 2 of FIG. 4. The contact points a_7 , b_4 of the switches A_7 , B_4 including the terminals E_{p7} , E_{M4} that are arranged to contact the pair of plates P_7 , M_4 mounted at the position S_n are closed. A hanger H with clothing thereon is on the arm 5 of the holder 2 as the holders are continuously transported along the guide rails 1 by the drive of the motivating system for the holders. When the holder 2 arrives at the distributing and supplying position S_n , the terminals E_{p7} and E_{M4} contact the plates P_7 and M_4 , respectively, the electromagnet 6 is energized via the contact points a_7 and b_4 of the switch A_7 and B_4 respectively, the plunger 7 is drawn into the electric coil 6A, the head 7A of the plunger projects to the outer side from the inner side of the longitudinal opening 4 of the front panel surface 2A, and the head 7A releases the hanger H from the holding arm 5 to the outer portion thereof. With reference to FIGS. 6A and B, the holding arm 5 at the front panel surface 2A of the holder 2 has a recess 8 on the upper portion thereof and a pair of parallel plates 11A and 11B. The space between the base plate 11A and 11B is fitted to the plunger head 7A. A hanger H resting in the recess 8 is released therefrom by the projection of the plunger head 7A which causes the hanger to slide along the inclined surface 9 to thereby release it from the holder 5. On the other hand, at each distributing and supplying position S ($-S_{n-1}$, S_n , S_{n+1}), a supporting lever 10 is mounted which is positioned at the same level and inclination as the arm 5 of the holder 2. The lever or bar 10 functions to continuously support the hanger H released from the holding arm 5. Switches A (A_0 - A_9) and B (B_0 - B_9) mounted on each holder 2 brought into play by closing the predetermined pair after the decision on a particular distributing position is reached. The holders 2 with a loaded clothes hanger M thereon are conveyed along the track 1 until the

holder arrives at the predetermined distributing position S. When this occurs electric current is supplied to the electromagnet 6 which operates to release the clothes hanger H from the holding arm 5 to the corresponding supporting lever 10 at the position S. When the holder 2 passes under other distributing positions, even if the contact plates P and M at the other positions contact the terminals E_p (E_{p0} - E_{p9}) and E_M (E_{M0} - E_{M9}), the electromagnet 6 is not connected to an outer power source and the hangers remain on the arm 5.

What is claimed is:

1. An apparatus for distributing clothing on hangers to predetermined locations along a continuous path of travel comprising a plurality of spaced apart hanger holding devices mounted for movement along the path of travel, each holding device having a series of positive terminals and a series of negative terminals with a switch connected to each terminal, an arm on each holding device for releasably holding a clothes hanger thereon, electrically operable releasing means on each holding device for releasing the clothes hanger from the device at a predetermined location along the path of travel, conducting means connecting one side of the releasing means to the switches associated with the positive terminals and the other side of the releasing means to the switches associated with the negative terminals, and energy transmitting contact means at each predetermined location positioned to contact a predetermined pair of the positive and negative terminals whereby the releasing means is activated when the switches connected to those terminals engaged by the contact means are closed so that the clothes hanger is released from the arm.

2. An apparatus as in claim 1 wherein the releasing means associated with each holding device includes an electromagnet and a reciprocable plunger that urges the clothes hanger away from the arm when a hanger holding device arrives at a predetermined position, the energy transmitting contact means causing current to flow to the electromagnet to effect the discharge of the hanger away from the arm.

3. An apparatus as in claim 2 including a stationary bar at each predetermined location along the path of travel of the hanger holding devices, each bar being directly adjacent the arm at the predetermined locations and arranged to receive and hold the clothes hangers when they are released from the hanger holding devices.

* * * * *