March 1, 1955 M. L. BEYER 2,703,169

MAIL HANDLING TABLE

Filed Dec. 3, 1953 3 Sheets-Sheet 1

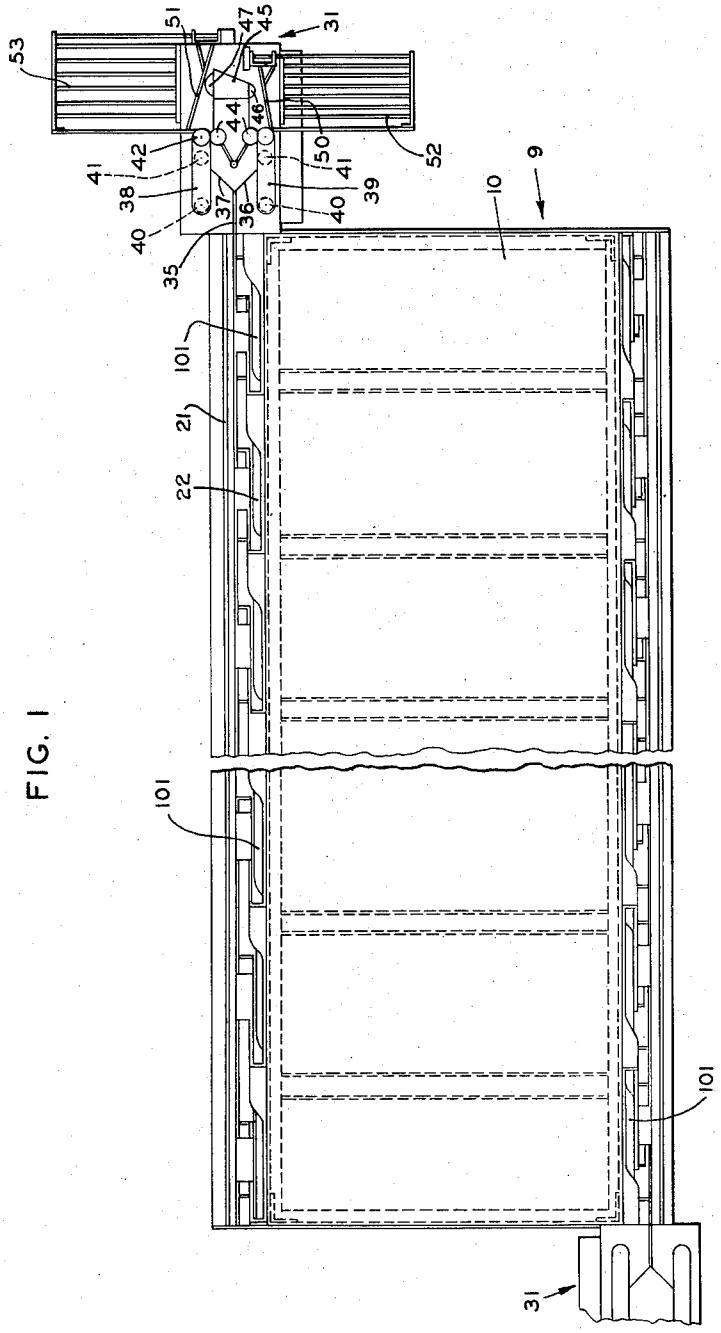


FIG. 1

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MAIL HANDLING TABLE

Filed Dec. 3, 1953 3 Sheets-Sheet 2

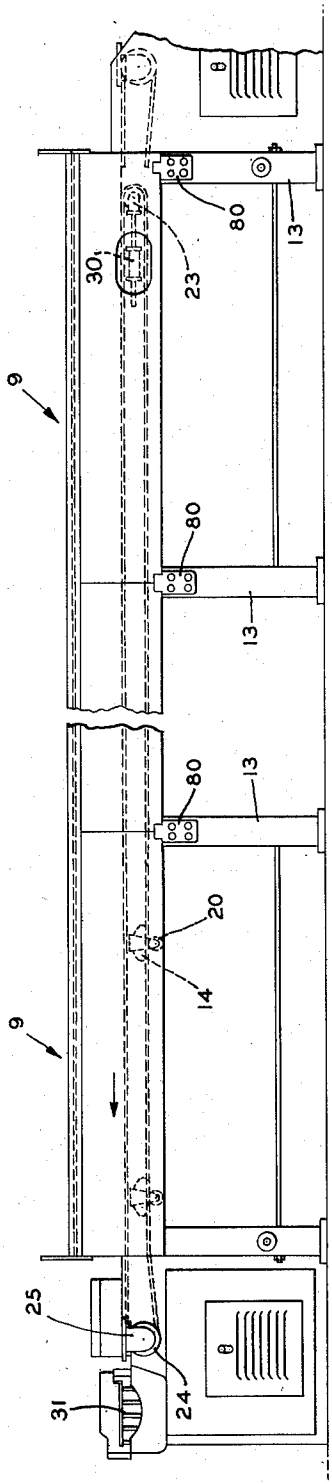


FIG. 2

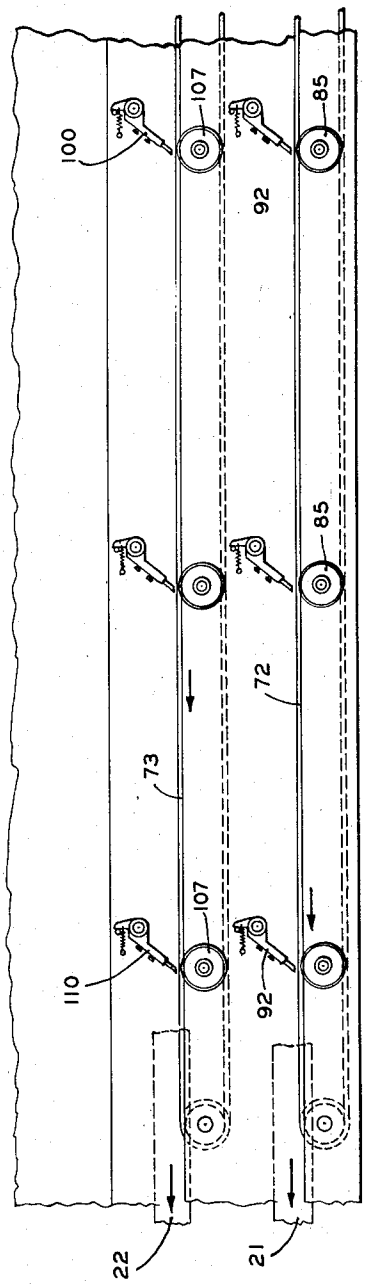


FIG. 3

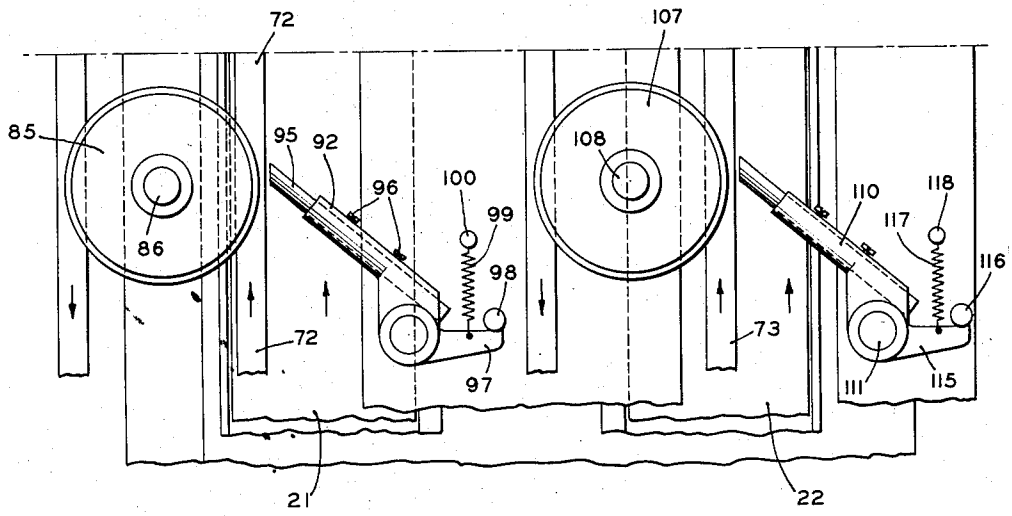
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MAIL HANDLING TABLE

Filed Dec. 3, 1953 3 Sheets-Sheet 3

FIG. 4



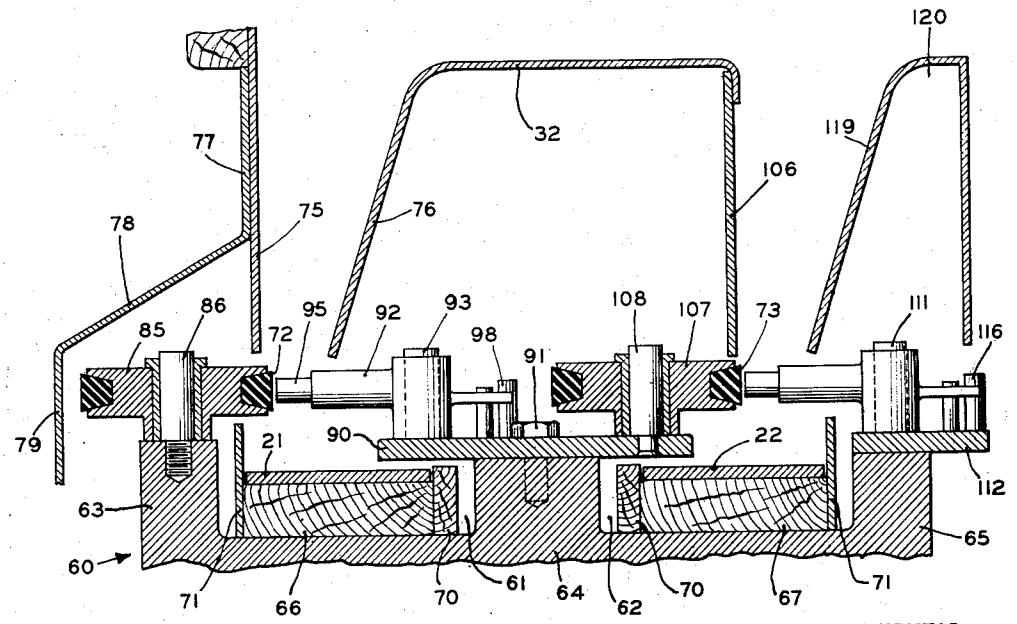


FIG. 5

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2,703,169

Patented Mar. 1, 1955

2,703,169

MAIL HANDLING TABLE

Millard L. Beyer, Hempstead, N. Y.

Application December 3, 1953, Serial No. 395,900

6 Claims. (Cl. 198—34)

This invention is a continuation in part of the application Serial No. 309,877 of Millard L. Beyer, filed September 16, 1952, and relates to a conveyor system for a combined mail sorting table and mail processing device.

Dual stacking units and combined dual cancelling and stacking devices are now available which operate at such high speed that conventional flat belt conveyors are inadequate to feed envelopes in sufficient quantity as to keep such units operating at their maximum capacity which is of the order of two thousand envelopes per minute.

It is contemplated that each sorting table shall have the usual eight operating positions on one or both sides. At each operator's position there is a card pocket for short envelopes, the respective pockets being arranged over a horizontal belt, while the long envelopes are deposited in a common slot arranged over a second horizontal belt disposed alongside the belt for the short envelopes. Both belts carry the envelopes riding on their edges and properly faced toward the processing device where they are carried along through the processing device by a second conveyor system associated with the processing device.

The envelopes are deposited usually in bunches by the respective operators properly faced on the belts. When the conveyor belts are operated at sufficiently high speed to feed a number approaching the maximum to the processing device, the various bunches of envelopes encountering each other have a tendency to jam, often necessitating stoppage of the entire conveyor system until the jammed envelopes can be released by hand.

Accordingly, an object of this invention is to provide on the sorting table per se simple mechanisms individual to the operating positions which will spread out the envelopes from the respective operating positions and thus de-bunch the envelopes before jams can occur. This permits more rapid operation of the entire sorting table conveyor system and makes it easier for the stacker or a combined cancelling machine and stacker to feed the envelopes one at a time to the star wheel of the stacker. Heretofore, individual envelopes were not separated from bunches of envelopes until the bunches had reached the cancelling and stacking mechanism.

The invention will now be described with the aid of the accompanying drawings, of which:

Fig. 1 is a plan view of a mail sorting table having a pair of flat conveyor belts disposed on each side of the table together with a mail processing device for each pair of belts which in this embodiment of the invention is a stacker;

Fig. 2 is a front elevational view of the table;

Fig. 3 is an enlarged top view of the table showing a pair of associated flat conveyor belts, pulleys for supporting V-belts, spring loaded separator arms and idler pulleys for the V-belts associated therewith;

Fig. 4 is a plan view showing an arrangement of flat conveyor belts, idler pulleys mounted on vertical axes and separator arms associated with the respective idler pulleys;

Fig. 5 shows a preferred embodiment of the invention in cross section.

Referring now to Figs. 1 and 2 of the drawings: the sorting table **9** is generally similar to that of the parent case and comprises a flat smooth upper surface **10** of heavy ferrous metal provided with legs **13**. Though not shown in detail in the drawings the table legs are formed of heavy iron with a T-shaped cross section.

A number of spaced brackets **14** are fastened to the table. The brackets are formed with depending arms. Near the lower end of each of these arms a roller **20** is supported in suitable bearings formed in the arms. These rollers support the lower run of a pair of flat conveyor belts **21** and **22** while the upper run of the belts are supported by long strips or blocks of wood which provide a flat running surface for the belts. This arrangement will be described in detail below.

The end portion of the conveyor belts are supported by being looped about rollers **23** and **24**, one of which is driven by a suitable motor not shown. This motor may be connected with other driven elements of the table, about to be described in the conventional manner.

In the embodiment of the invention shown in Figs. 1 and 2 duplicate conveying and processing apparatus is provided for opposite sides of the sorting table which usually is provided with eight operators' positions on each side of the table. The operators arrange the envelopes and deposit the same on one or the other of each pair of belts in accordance with their length, the stamps being positioned at the lower leading edge of the envelopes and facing the outer edge of the table so that they will be fed in the direction of roller **24** in order that the cancelling machine will invariably imprint a cancelling mark over the stamp. A suitable dual cancelling device is described in the joint application of Millard L. Beyer and Ernest Persson, Ser. No. 273,630, filed February 27, 1952. In case the envelopes are fed directly to a stacking device, the method of arranging the envelopes just described makes it possible to feed them directly to independent cancelling machines without further rearrangement.

Conveyor belt roller **24** is mounted preferably on a suitable bracket **25** which supports the roller and the eject end portion of the belts**2 1** and **22** some distance beyond the end of the table. This extending portion of the belt is intended to be used as part of the feeding mechanism of a dual cancelling and stacking unit such as that described in the above-mentioned application or the dual stacker unit shown schematically in the drawings.

As shown in connection with the front conveyor belt in Fig. 2 the right hand roller **23** therefor is laterally adjustable to maintain the belt at a desired tension by a screw arrangement **30** attached to the roller support. In this figure at the right hand end of the table the extending portion of the rear conveyor belts is shown.

A side view of the dual stacker unit **31** is shown schematically at the left hand end of the table in Fig. 2 and at the right hand end of the drawing in Fig. 1. A portion of a similar stacking unit is also shown at the left hand end of the table in this figure.

As will be described with greater detail further on there is a longitudinal housing **32**, Fig. 5, extending between each pair of flat conveyor belts which acts as a guide for the envelopes on one side of each conveyor belt. This partition is shown in Fig. 5.

The housing **32** terminates at the end of the table and the guideway is continued by a vertical elongated plate **35**, Fig. 1, which extends between the extended eject portion of the flat belts **21** and **22**. Plate **35** is part of the detachable dual stacker unit and serves to guide and keep separate the long and short envelopes from flat belts **21** and **22**. Likewise, plate **35** could be part of a combined dual endorsing and stacking device disclosed in the above-mentioned application.

Referring to Fig. 1, flat plates **36** and **37** are pivoted to the outer end of vertical plate **35**. These plates are lightly spring loaded in such direction as to press their outer ends away from each other in the direction of shields **38** and **39** formed of thin metal which fit over pulleys **40** and **41** indicated by dotted lines. Such pulleys are part of each stacker unit and one set is provided for each flat belt **21** and **22** and each associated pair of pulleys carry short, which are similar for each section of the stacker unit shown carry horizontally relatively narrow V-belts spaced above the respective conveyor belts **21** and **22** so as to engage the sides of any envelopes coming into contact therewith and urge the same forward while cooperating with the hinged plates **36** and **37** to keep the envelopes travelling on their edges. The short V-belts driven by pulleys **40** and **41** are not shown since they are partially concealed by the associated pulley shields. The shields are provided for protection for the fingers of the attendants. Just beyond pulleys **40** and **41**

is a driven pulley 42 partially covered by the adjacent shield 38 or 39. This pulley cooperates with an idler pulley 44 mounted in the known manner on yielding arms. The arrangement just described separates the envelopes so that they pass therebetween one at a time to the associated star wheel of the dual stacker unit. Shield 45 covers a pair of so-called star wheels of a known kind, 47 for long envolpes and 46 for short envelopes. The star wheels operate in the usual manner, kicking the individual envelopes outward one at a time against sliding stop plates 50 or 51 until there is an accumulation of envelopes in the baskets 52 or 53 formed by an assembly of spaced rods. As the stacked envelopes fill up the baskets, attendants remove them and push sliding plates 50 and 51 back to an initial position adjacent the star wheels when they are again pushed back as fresh envelopes are urged outward by the respective star wheels.

Referring to Figs. 4 and 5 which show in detail a preferred embodiment of the invention, adjacent either or both edges of the table and between the upper and lower runs of the flat belts 21 and 22 a shelf or ramp 60 extends the length of the table. Shelf 60 is formed with a pair of spaced longitudinal grooves or troughs 61 and 62 in which the upper runs of belts 21 and 22 are disposed. Troughs 61 and 62 are bounded by upwardly projecting ribs or ridges 63, 64 and 65.

A flat strip of wood 66 or 67 rests in the respective troughs to provide a flat uniform surface to support the upper runs of flat conveyor belts 21 and 22. A wooden strip 70 and a metal plate 71 are positioned at the opposite sides of the wooden strips 66 and 67 to provide guideways for the belts 21 and 22.

A feature of the invention is the provision of V-belts 72 and 73 having runs overlying in spaced relation an edge portion of each of the flat conveyor belts 21 and 22. The V-belts are mounted on pulleys which turn about vertical axes and are driven in any suitable manner. Fig. 5 shows in section two troughs for guiding envelopes carried by conveyor belts 21 and 22. The trough for belt 21 which carries long envelopes is formed by a vertical plate 75 on the outer side while the inner side of the trough is formed by the slanting side plate 76 which is one side wall of the central housing 32.

Plate 75 is supported by being attached to a longitudinal plate 77 which is bent over at 78 and then formed with a vertical section 79, the latter being fastened by hinges 80 to the table legs, Fig. 2, to permit the entire guideway outer side of the guideway including plate 75 to swing outward to give access to the belts for servicing.

A series of idler pulleys 85, Fig. 5 which turn on vertical spindles 86 are mounted on rib 63 underneath the slanting plate 78 which provides a housing therefor. The outer edge of V-belt 72 projects slightly beyond guideway plate 75 so as to engage the sides of envelopes coming into contact therewith and thereby urge them along the channel in the direction of movement of flat belt 21. Idler pulleys 85 are positioned between each of the operators' positions to provide a firm support for V-belt 72 as indicated in Fig. 2.

A longitudinal metal plate 90 is fastened flatwise to center rib 64 by bolts 91. Overlying belt 21 in spaced relation is a row of arms 92 mounted on vertical spindles 93. The respective arms are so located and shaped as to extend across belt 21 diagonally in the direction of one of the idler pulleys 85. Each arm is provided with a tip portion 95 of rubber which is adjustably fastened in a recess in the arms by set screws 96.

Arms 92 are formed with tail pieces 97 which are normally held against stop pins 98 by springs 99, Fig. 4, connected between the tail piece and spring post 100. The rubber arm tips 95 are set so as to be spaced a slight distance from V-belt 72.

Referring to Fig. 1, the sorting table may be provided, optionally, with a card pocket 101 of the known kind overlying flat conveyor belt 22 which prevents envelopes beyond a predetermined length from being deposited on belt 22. Offset from the card pocket openings and disposed between each operator's position, belt 22 is associated with a V-belt and swinging arm arrangement similar to that used in connection with belt 21.

V-belt 73 has a run overlying an edge portion and driven in the same direction as belt 22, the run projecting slightly beyond wall 106 of housing 32, which wall forms the outer side of the guideway for short envelopes. V-belt 73 rides in spaced relation to belt 22 upon a series of pulleys including idler pulleys 107 which turn on vertical spindles 108 mounted on plate 90. There is preferably one idler pulley 107 positioned between each of the card pockets 101. Cooperating with belt 73 in each instance where the belt is supported by an idler pulley 107 is a swinging arm 110 extending diagonally across belt 22 in the direction of the periphery of an idler pulley 107. The swingable arms are mounted upon vertical spindles 111 fastened to a longitudinally extending metal strip 112. Arms 110 are provided with tailpieces 115 which tend to rest against stop pins 116 due to the pull of springs 117 stretched between tailpiece 115 and spring post 118.

The rear wall of the guideway may be the side wall 119 of a housing 120 which encloses the mountings for swinging arms 110.

The invention operates as follows: When bunches of envelopes are placed on a flat conveyor belt 21 or 22 at any of the operators' positions, those in contact with V-belts 72 or 73 will be carried forward while others will engage swinging arms 92 or 110 which are lightly spring loaded. Due to the motion of the belts 21 or 22 and the slanting position of the arms the envelopes in the bunches will tend to separate and come into contact with the associated V-belt which will aid the flat conveyor belts in transporting the envelopes spreading them out along the belt. In this way the bunches of envelopes are substantially broken up before reaching the next operator's position where further bunches of envelopes may be deposited upon the conveyor belts without danger of jamming with envelopes already passing the position. This makes it possible to operate the conveying system at a speed considerably in excess of that attained with the conventional flat belt system.

What is claimed is:

1. A conveyor system for a combined mail processing apparatus and mail sorting table having a plurality of operators' positions which comprises a pair of flat conveyor belts mounted side by side below the surface of the table near an edge thereof for conveying mail to the processing apparatus, one belt being for long envelopes and the other for short envelopes, a plurality of spaced envelope pockets, one for each operator's position disposed over the latter belt, a V-belt having a run overlying in spaced relation an edge portion of each flat belt and running in the same direction, a plurality of spring loaded arms supported on vertical axes having tip portions extending across the respective flat belts in alignment with the V-belts for uniformly distributing along the belts bunches of envelopes coming into contact therewith, and an idler pulley mounted upon a vertical axis for supporting the V-belt immediately adjacent the tip of each spring loaded arm.

2. A conveyor system for a combined mail processing apparatus and mail sorting table having a plurality of operators' positions which comprises a pair of flat conveyor belts mounted side by side below the surface of the table near an edge thereof for conveying mail to the processing apparatus, one belt being for long envelopes and the other for short envelopes, a plurality of spaced envelope pockets, one for each operator's position disposed over the latter belt, a V-belt having a run overlying in spaced relation an edge portion of each flat belt and running in the same direction, a plurality of spring loaded arms uniformly spaced along the flat belts extending across the flat belts having tip portions in register with an associated V-belt for uniformly distributing along the belts bunches of envelopes coming into contact therewith, and an idler pulley mounted upon a vertical axis for supporting the V-belt immediately adjacent the tip of each spring loaded arm.

3. A conveyor system for a mail sorting table having a plurality of operators' positions which comprises a pair of flat conveyor belts mounted side by side below the surface of the table near an edge thereof, one belt being for long envelopes and the other for short envelopes, a plurality of spaced envelope pockets, one for each operator's position disposed over the latter belt, a V-belt having a run overlying in spaced relation an edge portion of each flat belt and running in the same direction so as to cooperate with the flat belts in carrying envelopes, a plurality of spring loaded arms uniformly spaced along the flat belt having tip portions in register with an associated V-belt for distributing uni-

formly along the belts bunches of envelopes coming into contact therewith, an idler pulley mounted upon a vertical axis for supporting the V-belt immediately adjacent the tip of each spring loaded arm, and a stop for each arm to hold the tip thereof in spaced relation with the V-belts.

4. A conveyor system for a mail sorting table having a plurality of operators' positions which comprises a pair of flat conveyor belts mounted side by side below the surface of the table near an edge thereof, one belt being for long envelopes and the other for short envelopes, a plurality of spaced envelope pockets one for each operator's position disposed over the latter belt, a V-belt having a run overlying in spaced relation an edge portion of each flat belt and running in the same direction, and a pair of spring loaded arms extending respectively part way across the conveyor belts between each of the operators' positions for distributing uniformly on the flat belts separate envelopes from bunches of envelopes coming into contact therewith.

5. A conveyor system for a mail sorting table having a plurality of operators' positions which comprises a pair of flat conveyor belts mounted side by side below the surface of the table near an edge thereof, one belt being for long envelopes and the other for short envelopes, a V-belt having a run overlying in spaced relation an edge portion of each flat belt and running in the same direction, and a pair of spring loaded arms

extending respectively part way across the conveyor belts between each of the operators' positions in the direction of one or the other of the V-belts for distributing uniformly along the belts individual envelopes from bunches of envelopes coming into contact therewith.

6. A conveyor system for a mail sorting table having a plurality of operators' positions which comprises a pair of flat conveyor belts mounted side by side below the surface of the table near one edge thereof, one belt being for long envelopes and the other for short envelopes, a pair of V-belts, one for each flat belt, each having a run overlying in spaced relation an edge portion of the associated flat belt, a plurality of idler pulleys for the V-belts, a pair of spring loaded arms extending respectively part way across the conveyor belts between each of the operators' positions in the direction of one or the other of the V-belts for distributing uniformly along the belts individual envelopes from bunches of envelopes coming into contact therewith, the idler pulleys being disposed opposite the free ends of said arms to provide support for the V-belts.

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