D. H. PARCE.

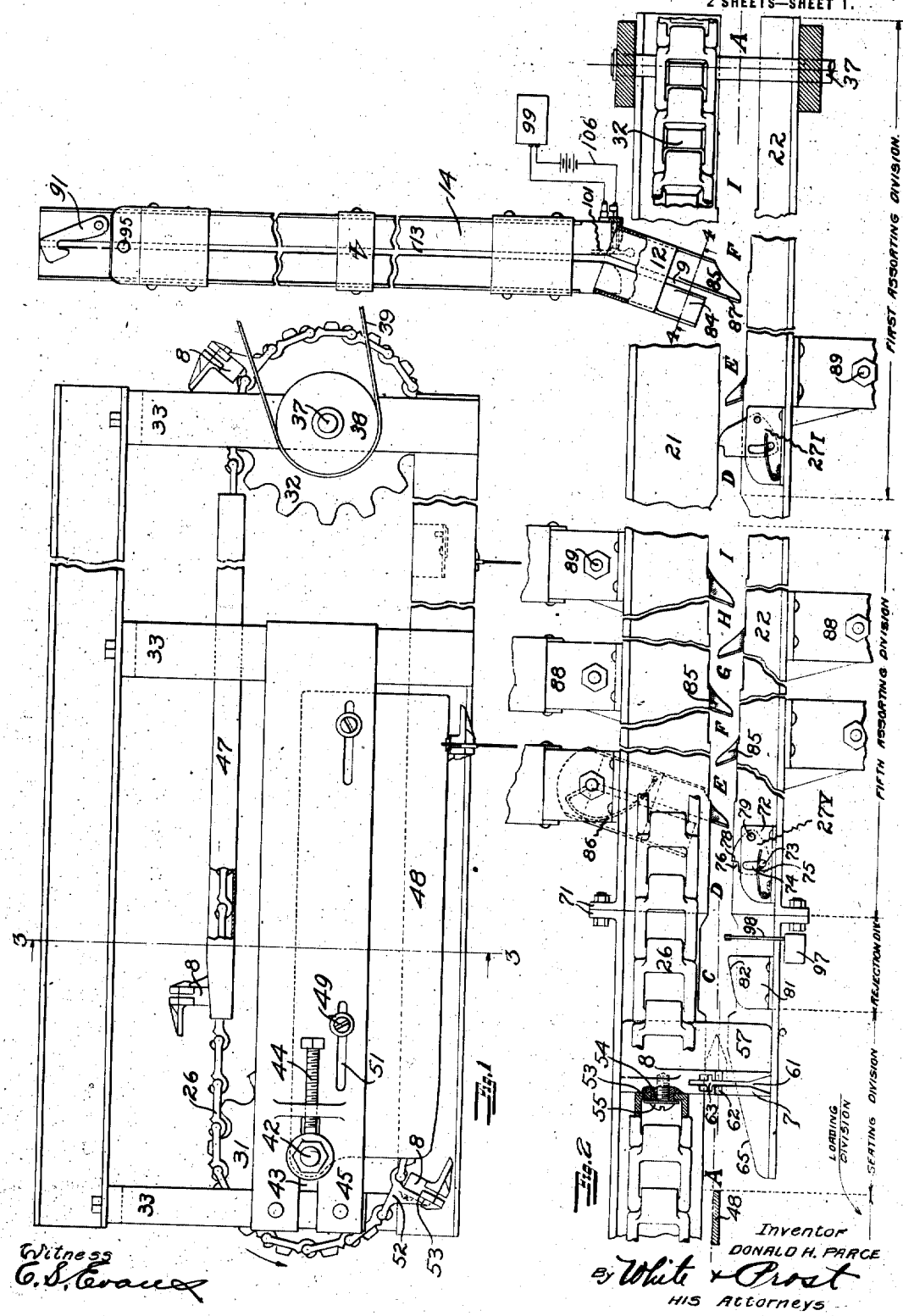
ASSORTING APPARATUS.

APPLICATION FILED MAY 29, 1916.

1,217,988.

Patented Mar. 6, 1917.

2 SHEETS—SHEET 1.



Witness
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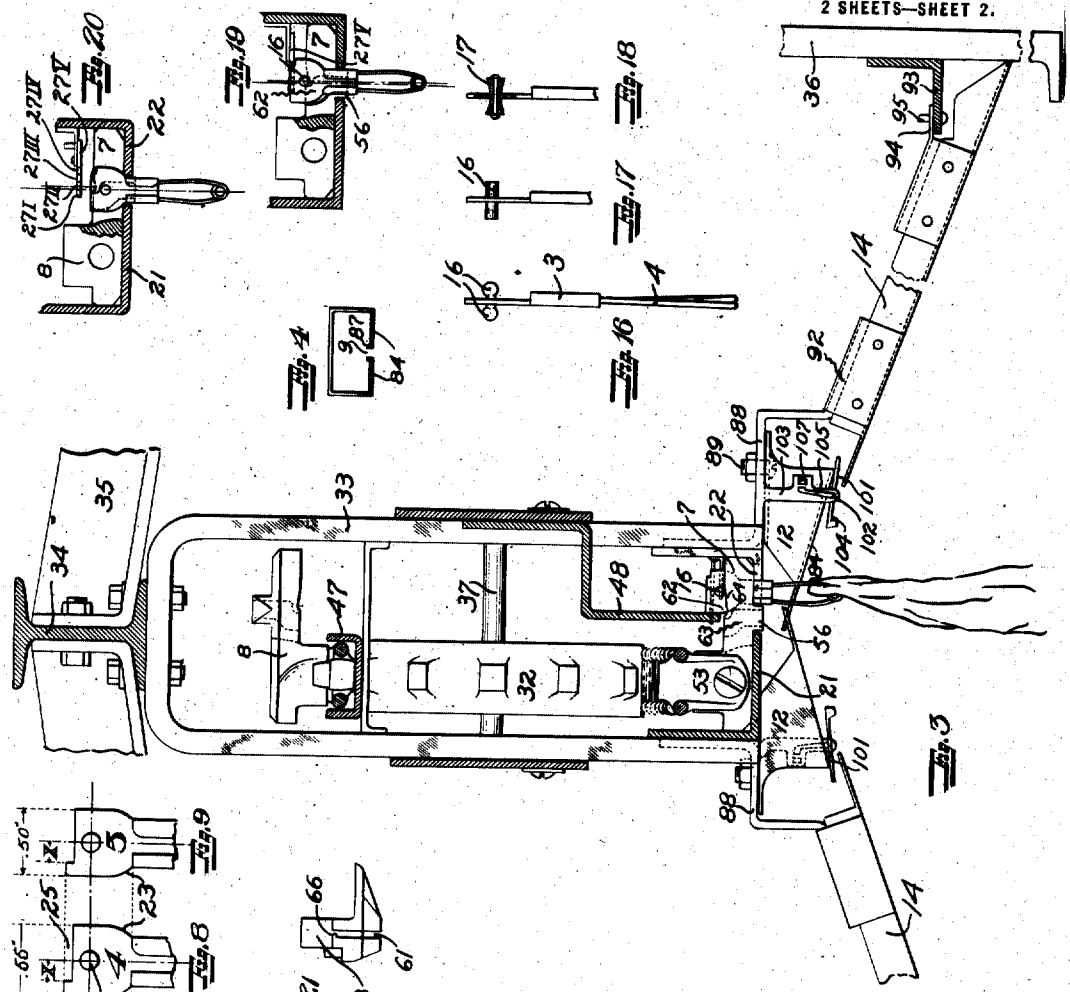
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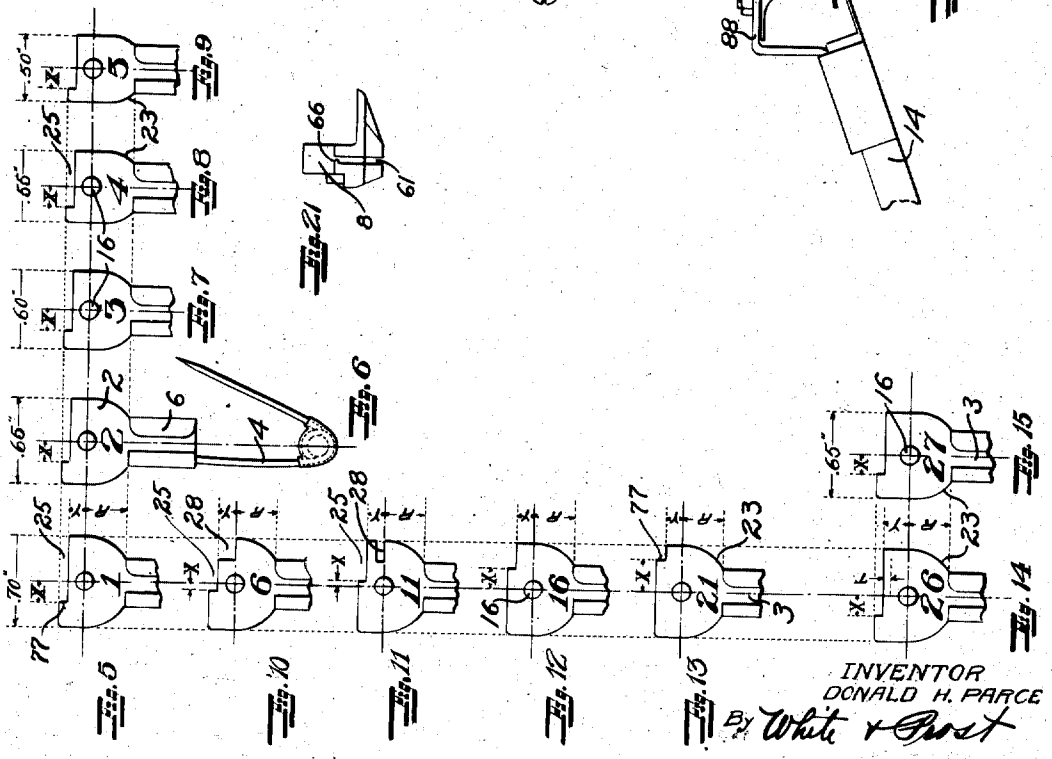
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UNITED STATES PATENT OFFICE.

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ASSORTING APPARATUS.

1,217,988. Specification of Letters Patent. Patented Mar. 6, 1917.

Application filed May 29, 1916. Serial No. 100,732.

To all whom it may concern:

Be it known that I, DONALD H. PARCE, a citizen of the United States, and a resident of Oakland, county of Alameda, State of California, have invented a new and useful Assorting Apparatus, of which the following is a specification.

My invention relates to automatic assorting apparatus similar to that disclosed in my co-pending application Serial Number 847,016.

An object of my invention is to provide an apparatus for assorting and collecting into separate lots, articles of like description or ownership.

Another object of my invention is to provide an apparatus in which articles bearing different identifying tags are sorted from each other and deposited at predetermined points in accordance with the characteristics of said identifying tags.

Another object of my invention is to provide an assorting apparatus into which tagged articles may be loaded and secured by the tags, the form of the tag being such that the apparatus will deposit it and the article to which it is attached at a predetermined point.

Another object of my invention is to provide an apparatus for sorting pieces of laundry to which tags have been attached, and depositing the tagged articles at predetermined points with the tagged ends together.

Another object of my invention is to provide an apparatus for sorting articles of laundry which may be used in connection with the assorting tag which is the subject of my co-pending application Serial Number 100,731.

Another object of my invention is to provide an apparatus for assorting articles and recording the total number of articles assorted and the number in each assortment.

The invention possesses other features of advantage, some of which, with the foregoing, will be set forth in the following description of the preferred form of my invention which is illustrated in the drawings accompanying and forming part of the specifications. It is to be understood that I do not limit myself to the showing made by the said drawings and description, as I may adopt variations of the preferred form within the scope of my invention as set forth in the claims.

Referring to the drawings:

Figure 1 is a side elevation of a part of the assorting apparatus, a portion being broken away to reduce the length of the figure. The loading side of the apparatus is shown.

Fig. 2 is a plan of a part of the assorting apparatus, showing the trackway, mechanism for releasing the tag and other correlated parts. Portions of the apparatus are broken away to reduce the length of the figure.

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 1. Portions of the supporting frame are broken away to reduce the size of the figure.

Fig. 4 is a section through the receiver taken on the line 4—4 of Fig. 2.

Figs. 5 to 9 inclusive are views of the five tags comprising the first division of the first series of tags. Fig. 6 is a view of the complete tag and pin, the pin and a portion of the shank being omitted in Figs. 5, 7, 8 and 9.

Figs. 10 to 13 inclusive are fragmentary views showing the conformation of the tops of the first tags in each of the second, third, fourth and fifth divisions respectively, all of the first series of tags.

Figs. 14 to 15 are fragmentary views showing the conformation of the tops of the first and second tags in the first division of the second series of tags.

Fig. 16 is a side view of the tag.

Figs. 17 and 18 are fragmentary side views showing modified forms of the tag.

Fig. 19 is a fragmentary sectional view through the track taken in a vertical plane and showing the tag resting in its seat on the carrier.

Fig. 20 is a fragmentary sectional view through the track taken in a vertical plane and showing the tag resting upon the track and in the carrier.

Fig. 21 is an end elevation of a modified form of carrier.

The assorting apparatus of my invention may be adapted to many different industries, but I consider that one of its most useful

applications will be in laundries and dry cleaning establishments for the automatic assorting into individual lots or bundles of the washed or cleaned articles and I shall therefore describe my invention in this application in connection with this use.

In laundries the labor of sorting out the individual articles belonging to the various patrons is now, so far as I am aware, performed by hand. The process is a slow one, attended by many chances of error and is, therefore, apt to be unduly costly. It is one of the objects of my invention to provide an apparatus by means of which this assorting is done rapidly, accurately and cheaply.

All articles coming into a laundry to be washed are marked in some way, usually with ink or a label. These methods are objectionable and expensive and in no way further the work of assorting which must be accomplished piece by piece with hand labor. In using my invention, a tag is pinned onto each piece or group of small pieces to be washed when the bundle is received. Preferably the tag is numbered and only tags of the same number or description are pinned to pieces in a given lot or bundle. The bundle from the home of J. Roe is, for instance, allotted the number 12 and each piece in the bundle or group of small pieces, has a tag bearing that number attached thereto, and all the tags bear that number and are of the same conformation or description. Preferably, the pieces are counted when the bundle is first opened and the tags attached; and a memorandum of the name, of the owner of the bundle or tag number and the number of pieces in the bundle, is made for future reference as will be made clear herein. It is seen, therefore, that the tag is an identifying means, taking the place of the ink marking and attached labels, and this, that is, the function of identifying the article to which it is attached, is the first of several functions possessed by the tag.

After the washing process has been completed, the articles may be dried in the unsorted state and then sorted; or the sorting and drying steps may be combined. So far as my invention is concerned, it is immaterial, for in either case the tagged article or group of small articles, as for instance several handkerchiefs together on one tag, are loaded into the conveyer of my assorting apparatus by the operator and are then carried out from the loading point and deposited at points determined by the characteristics or conformation of the tag. The conveyer may be arranged to run through a drying room after leaving the loading point, the pieces of laundry being loaded wet and the pieces being dried as they pass through the drying room. On emerging from the drying room the pieces are automatically assorted. If desired, the pieces are dried unassorted and are not loaded into the assorting apparatus until dry. The loading of the tagged pieces into the conveyer of the apparatus is effected by slipping the tag into a slot in a carrier on the conveyer which travels at a low speed past the loading point. The piece is pendently supported from the tag which alone is held by the carrier. This is the second function performed by the tag, viz., that of supporting or carrying the piece, while it is being conveyed from the loading point to the point of discharge from the conveyer.

The tags are released from the apparatus at predetermined points and these points are fixed by the shape or conformation of the head of the tag and by its size. A given shape and size is released at a certain point and all tags of that shape and size are released at the same point. Other shapes and sizes are released at other points, each shape and size of tag corresponding to a definite point of release. In effecting by its shape and size the release of the piece from the conveyer at a predetermined point, the tag performs a third function; that of assorting the pieces.

When the pieces are released from the conveyer at the predetermined points, each lot or bundle is found to be collected together in a certain portion of the apparatus from whence the pieces are removed and the tags taken off. The pieces are then ready to be bundled and shipped out. Counters to indicate the total number of pieces sorted and to show the quantity in each collector or bundle at the close of the run may be arranged upon the machine.

The tags, (Figs. 5 to 18 inclusive.)

The tag comprises a flat plate or head 2, formed preferably of metal inert in the various liquids used in laundries. A shank 3 extends from the head, and fastening means for attaching the tag to the articles to be assorted, such as a pin 4, is attached to the shank, one side of which is turned over to provide a lip 6 into which the sharp point of the pin closes.

In order to support the tag in the jaws 7 of the carrier 8 during the first stage of its progress through the assorting mechanism, and in the slot 9 of the receiver 12 and slot 13 of the collector 14 during the last stage, the head 2 of the tag is provided with a lug 16 on both sides rigidly secured to the tag. Preferably the ends of the lugs are knobbed or upset as shown in Fig. 16. If desired, the lug may be left of cylindrical form as shown in Fig. 17, or it may serve as a shaft upon which small rollers 17, Fig. 18, are mounted.

During the middle stage of the tag's progress through the machine it is supported by

the contact of the track members 21 and 22 with the shoulders 23 which are formed on each side of the shank 3. The width of these shoulders varies in the tags of any given division as shown by Figs. 5 to 9 inclusive.

It must not be understood that any particular size or proportion of tags are essential in the practice of my invention, but I have found it convenient to make the smallest tag .50″ maximum width, the next size .55″, the next .60″ the next .65″ and the largest .70″. By arranging slots of corresponding widths between the tracks 21 and 22, the tags drop through at definite places therein. This variation in width is one of the two means which I provide for effecting the automatic assorting of the tags and attached articles. More than five widths of tag may be used if desired, but this is a number giving a convenient size, neither too small nor too large, and with sufficient variation between the sizes to make great accuracy of the correlating mechanism unnecessary. A second means of differentiating the tags is provided by the shape of the top portion of the head and I find it convenient to use five different shapes for each width of tag head, thus giving twenty-five different tags which vary from each other in width or shape or both width and shape. The variations in shape are preferably obtained by notches 25 cut in one of the upper corners so that the shape or extent of the tag relative to the horizontal and vertical center lines through the lug 16 is varied. For convenience, the group of tags shown in Figs. 5 to 9 inclusive are referred to as tags of the first division. It will be observed that while the units of this division vary in the width of the head, the distances X and Y are constant for the division. I find it convenient to make X equal to .15″ and Y equal to .125″, but it is to be understood that tags may be made with proportions and dimensions other than those which I have mentioned. The tags or units of the second division differ from those of the first only in the dimension X which is conveniently made .05″. Fig. 10 illustrates the shape of the top of the first tag of the second division and the other four tags of this division vary in size as shown in Figs. 5 to 9 inclusive, only differing therefrom in the size of the dimension X. The dimension Y remains the same for all tags in both divisions. The third, fourth and fifth divisions of tags comprise in the same manner groups of five tags each, the shape of the top of the first tag in each division being shown in Figs. 11, 12 and 13 respectively, and the size varying in the same way as explained for the first and second divisions. The dimension Y remains constant throughout, but with each division the dimension X varies. I find it convenient in the third division to make X equal to .05″ on the opposite or right side of the vertical center line; in the fourth division, .15″ on the right side of the vertical center line; and in the fifth division .25″ on the right side of the center line.

From the above and from inspection of Figs. 5 to 13 inclusive, it will be clear that while in any given division the tags vary in width, the tags in that division have the same dimension X and that this dimension differs with each division; also that throughout the five divisions the dimension Y does not vary. These twenty-five tags, having the same dimension Y, constitute the first series of tags and are numbered from 1 to 25 inclusive. It will be understood without detailed explanation that a second series of twenty-five tags which may be numbered from 26 to 50, can be secured by increasing the dimension Y, that is, by lengthening the tag above the horizontal center line and running a new series of notches across the top as in Figs. 15 and 16, which show the shapes of the tops of the first and second tags of the first division of the second series. In the same way a third series of tags numbered from 51 to 75; and a fourth series numbered from 76 to 100 may be made. I find that .9625″ is a convenient amount to increase the dimension Y with each series and this increase is indicated in Fig. 14 as the dimension T.

When the tag is loaded into the carrier 8 on the conveyer chain 26 of a single series or twenty-five bundle apparatus, it stays in the carrier until it is released therefrom by a trip 27, the action or non-action of which is determined by the extent of the notch 25. If the notch extends nearly across the tag as in Fig. 5, the conveyer 26 carries the tag past all the trips 27V, 27IV, 27III and 27II, but the last trip to be reached 27I extends out far enough to catch and release the tag from the carrier. Each section of track is divided into assorting divisions with a trip at the entering end of each division. The trip 27I which is reached by the carrier last of all is at the entering end of the first assorting division; that is, viewing Fig. 2, the carrier 8 travels from left to right and the first assorting division of the track is at the right as indicated on the figure, the second, third and fourth assorting divisions being broken out to reduce the length of the figure.

After its release from the carrier 8, the tag then rides directly on the track 21—22 until the widening slot permits it to drop through into the receiver 12 which allows it to slide down into the collector 14. The tags of the first division, Figs. 5 to 9 inclusive, are all released from the carrier onto the track by the trip 27I which is the

last trip on the machine. The second division of tags, of which Fig. 10 shows the first tag, is released by the trip 27II (not shown) which is the second last trip on the machine, and so on for each division; the fifth or last division (in a single series machine) being released by trip 27V which is the first one reached.

With a single section of track as shown in Fig. 2, only the first series of twenty-five tags is used, but I contemplate arranging my apparatus so that the purchaser may, by the insertion into the trackway of a second section ahead of the first section and the use of a second series of tags, increase the capacity of the apparatus to fifty bundles. In the same way a third section may be inserted ahead of the second and a fourth section ahead of the third and a third and fourth series of tags added so that the capacity of the apparatus may be increased as desired.

In a multiple series apparatus it will be understood that the tags having the greatest dimension Y, that is, the greatest height above the horizontal center line, are most conveniently disposed of first, the shortest tags being carried to the end of the machine farthest from the loading point before they are tripped out of the carrier onto the track. The tags of the first series are the shortest; the tags of the second series are the dimension T, Fig. 14, higher than those of the first series, and therefore the trips for releasing them from the carriers are spaced higher than the trips for the first series so that the first series tags will pass under the second series trips without being released. In the same way the third series of tags are 2T higher than the first series; and the fourth series 3T higher, and the trips for these series are spaced at corresponding heights so that no tag of a series can engage the trip for the series of a higher number.

It should also be noted that all the tags of whatever division or series have the same dimension R; that is, the height from the beginning of the shoulder 23 to the horizontal center line of the lugs 16 is the same for all tags. In order to insure that the tags are properly placed in the carrier 8, means may be provided for rejecting from the carrier tags wrongly placed therein. In this case the tag is provided with a recess 28, Figs. 10 and 11, which is explained under the topic "Trips." Preferably the tag is formed without sharp corners.

The conveyer, (Figs. 1, 2 and 3.)

The conveyer consists of an endless chain 26 carried by sprocket wheels 31 and 32. The sprockets are mounted in a frame including members 33 preferably supported from an I-beam 34. The I-beam is conveniently carried by arch members 35 supported on the vertical members 36 which rest upon the floor. The shaft 37 of one of the sprockets is extended to carry a pulley 38 which is driven by the belt 39 from some suitable source of power (not shown). Preferably the ratio of speeds is such that the movement of the conveyer chain 26 is rather slow. The sprocket 31 is preferably adjustable so that the tension of the conveyer chain 26 may be varied. This is accomplished by positioning the sprocket shaft 42 in a slot 43 by means of a set screw 44. A nut 45 on each end of the shaft serves to fix the position of the shaft when adjusted. Preferably a slide way or support 47 for the upper reach of chain is disposed in the upper portion of the frame and a guard plate 48 is preferably arranged in front of the chain at the point where the tags are inserted into the carrier. This guard plate is preferably secured to the adjustable sprocket mounting so that its position relative to the sprocket and carriers traveling therefrom is not disturbed by the adjustment of the sprocket 31. The plate is further secured to the frame by means of screws 49 arranged in slots 51. The chain is composed of suitable links, between which are incorporated at intervals carrier links 52. Each of the carrier links is provided with an outstanding wall or lug 53 to which is pivotally connected the carrier 8, a lug 54 of the latter seating in an aperture of the wall 53 and being held therein by the screw 55. The conveyer performs a two-fold function. During the first stage of the progress of the tag through the machine the weight of the tag and whatever is attached to it rests directly upon the carrier which may be considered as part of the conveyer. During the second stage of the sorting operation, the tag is thrown off of but not out of the carrier, so that the weight of the tag is borne directly by the track, the conveyer then acting merely to propel the tag along the track until it drops through.

The carrier, (Figs. 1, 2 and 3.)

The function of the carrier is three-fold; it carries the tag during the first stage of the sorting process; it propels the tag along the track during the second stage and it prevents the tag from twisting out of the proper angle to the line of travel. In an apparatus to be used only for assorting and where the chain is carried on sprockets set in a vertical plane, the carrier extends outwardly at substantially right angles to the plane of the chain, but where the apparatus is to be used in a dry room or where the chain must make turns around sprockets set in a horizontal plane, the carriers are arranged on the chain substantially in the plane of the

chain. Preferably the carriers are so mounted as to have a limited pivotal motion upon the carrier links 52, and on the lower reach of the chain may slide along in contact with the tracks 21 and 22. Preferably the ends of the carrier abut against the upstanding edges of the track members 21 and 22 so that lateral displacement relative to the line of travel is prevented when the trip sweeps the tag out of the carrier. Preferably also a portion 56 of the carrier extends downwardly between the tracks so that as much bearing surface as possible is provided to maintain the tag in position when it rests upon the track as shown in Fig. 20.

The surface of the carrier in contact with the track is preferably increased by the extension 57 and this is done to secure greater stability of the carrier and prevent rocking thereof. The body of the carrier is provided with a slot 61 sufficiently wide to receive the body of the tag edgewise therein. The entrance to the slot is widened so that the tag may easily be inserted by the operator while the carrier is in motion.

At a point preferably slightly to the side of a vertical plane running through the center line A—A of the track slot, the top of the carrier is provided with a shallow seat 62 in which the lugs 16 of the tags are adapted to rest. Immediately beyond this seat the slot is widened into a channel 63 so that the tag including the lugs 16 will pass through it. This channel 63 slopes downwardly and away from the chain 26 and is widened under the seat 62 as shown in the dotted lines of Fig. 3, so that when the tag is released from the seat 62 and falls upon the track 21—22, it may assume a vertically upright position, its vertical center line intersecting the slot center line A—A, as shown in Fig. 20.

The guard plate 48 is placed so that the operator cannot push the tag too far back in the slot 61, and at loading the tag is merely pushed in until it strikes the guard when it will then rest on the slanting top 64 of the carrier jaws 7 as shown in Fig. 3. The first step in the automatic operation of the apparatus is the placing of the tag in the seat 62 accomplished by the contact of the tag shank 3 with the slanted edge 65 of the track member 22 aided by the sloping top surface of the carrier. If the slant 64 is not alone sufficient to seat the tag as soon as the guard plate 48 is passed, only a touch of the edge 65 is necessary to accomplish it. Fig. 19 shows the tag in the carrier resting in the seat. Preferably the seat 62 is so placed on the carrier that when the tag is resting therein, the shank 3 of the tag almost touches the edge of the track 22 at the narrowest portion D of the groove in the track. Fig. 20 shows the tag after it has been released from the seat 62, resting on the track 21—22 but still in the slot 61 of the carrier 8.

In case it is desired to prevent the insertion into the slot 61 of tags with the wrong side foremost, the slot may be provided with a ledge 66, Fig. 21. The extra thickness of the shank 3 of the tag will lie under this ledge, and when the tag is reversed, it cannot be inserted into the slot at all.

The track, (Figs. 2 and 3.)

The track is arranged in the lower portion of the supporting frame and preferably consists of two L-shaped members 21 and 22, which in addition to their functions as a track also serve to stiffen the frame construction. The position of the sprockets 31 and 32 in the frame is such that the lower reach of the conveyer chain 26 lies just above the track 21, the carriers 8 spanning the space between the tracks and extending across upon the other track member 22.

For convenience in reference the track is divided into a loading division, including the space at one end in which the tags are inserted into the carriers; a seating division, in which the tags are all pushed back into the seat 62 in which they hang suspended near the center of the track slot; a rejection division, in which tags wrongly placed in the carriers are released and dropped out of the machine; and one or more assorting sections, according to the capacity of the machine, each assorting section being divided into five assorting divisions.

The track 22 begins at the seating division, leaving the carriers free of access over the entire loading division. The two tracks 21 and 22 are spaced apart and the edges stepped so that a slot is formed between the tracks which varies in width on each side of the longitudinal center line A—A. The edge 65 of the track 22 is given a long slant so that tags inserted in the carrier in the loading devision are engaged by this edge and pushed backward, the lugs 16 resting in the seats 62.

At the rejection division the track slot is widened as shown at C, Fig. 2, so that the largest tag will fall through if it is ejected from the carrier at this division. The slot for each assorting division is the same and comprises a subdivision D which is slightly wider than the shank 3 of the tag, but smaller than the head of the smallest tag. The next subdivision E is slightly wider than the head of the smallest size tag; the subdivisions F, G, H, and I are each slightly wider than the heads of the second, third, fourth and fifth size of tags respectively. That is, for each tag there is a subdivision of the slot through which that tag and no larger one will pass. Preferably, the first

part of each subdivision is a few thousandths of an inch wider than the rest of that subdivision. At the end of the fifth assorting division, the slot narrows to the first subdivision D of the fourth assorting division. In each assorting division the subdivisions E, F, G, H and I correspond to the sizes of tags shown in Figs. 9, 8, 7, 6 and 5 respectively. As will be clear from the above, the conveyer carries the tag to a certain assorting division and drops it upon the track at the beginning of the division, then pushes it along until it reaches the slot subdivision of corresponding size, when it drops through.

In order to provide for an extension of the apparatus from twenty-five bundle capacity to fifty bundles or more each of the track members 21 and 22 are preferably separable between the rejection division and the assorting divisions and the parts at that point joined securely by bolts passing through flanges 71. The first section which carries the driving sprocket for the conveyer chain is always assembled on the extreme end of the apparatus. With the lengthening of the track by the insertion of new sections it is of course necessary to lengthen the conveyer chain to correspond. It is understood that except for the position of the trips, and the driving sprocket in the first section, all the track sections are the same.

The trips.—The trips 27 comprise means for releasing the tags from the carriers so that they are transferred or delivered onto the track. The trip is pivotally mounted on a plate 72 which extends outwardly from the track and is placed at such a height that it engages only the extreme upper portion of the tags of the corresponding series. The trip 27 is provided with a pin 73 extending upwardly through the slot 74 in the plate 72 and engaging a spring 75 which tends to keep the trip in the retracted position. A notch 76 is cut in the forward edge of the trip and the trip is so placed laterally of the line of travel of the tags that the edge 77 on the tag (Fig. 5) engages the edge 78 of the trip as the tag is conveyed along the carrier. The edge 78 of the notch 76 is only sufficient to give certain engagement with the tag and when the tag strikes the trip, the latter is turned on its pivot 79, sweeping the tag out of the seat 62 and over the edge into the channel 63 through which it falls upon the track. The trip then snaps back into normal position. Since the tags of the first division (Figs. 5 to 9 inclusive) are notched out nearly across the entire top, these tags will pass by the first four trips 27V, 27IV, 27III and 27II, but the last trip reached 27I, which extends out far enough to engage the edge 77 of the tag, will unseat the tags of the first division from the carrier. The tags of the fifth division (Fig. 13) are notched the least and these tags are tripped from the carrier by the trip 27V which extends toward the center line A—A only far enough to engage the edge 77 of that division.

Where the apparatus is built with a second section of track and a second series of tags, the trips on this second section are set the dimension T higher than those on the first section so as to engage the higher tags of the second series, but otherwise the trips are the same.

As the trip moves the tag backward out of the seat, there is a tendency for the tag to pivot about the lugs 16. By arranging the seat 62 on the carrier slightly to the side of the center of the slot as already explained, this swinging motion of the tag is prevented by the shank 3 of the tag engaging the edge of the track 22.

It may be advisable to make the slot 61 in the carrier without the ledge 66, Fig. 21, so that tags can be inserted therein with either side forward and since the trips are preferably arranged to act only when the tags are placed in the carriers with the numbered face forward, means may be provided for ejecting from the carriers any tag wrongly placed therein. This means preferably comprises a thin plate 81 having a slanting edge 82 secured to the track 22 at such a height that when the tags are properly placed in the carrier, they are carried past the trip 81, which passes through the recess 28 of the tag. If the tag is placed wrongly in the carrier, the side which has no recess strikes the slanting edge 82 and is swept out of the seat 62 and falls through the track out of the machine. The recess 28, if used at all, is formed in all the tags of whatever series. It may be formed distinct from the notch 25 as in Fig. 11, but it will be found convenient to form one as a continuation of the other as in Fig. 10.

The receiver and the collector, (Figs. 2, 3, 4 and 5.)

Means are provided for receiving the tags when they drop through the slot, and collecting them, together with the attached articles so that they may be conveniently handled. A receiver 12 is pivotally mounted upon the tracks just below the dropping point in each width of track slot. The receivers may be arranged all on one side of the track or they may be arranged on both sides as shown in Fig. 2, according to convenience. The receiver 12 is provided with a slot 9 completely dividing the bottom wall 84 of the member and the slot is of such width that a tag passes edgewise easily therethrough, being supported therein by

the projecting lugs 16 bearing against the edges adjacent the slot. The bottom wall 84, (Fig. 3) is sharply inclined so that a tag dropped therein will slide down the slot. Normally the receiver for a given subdivision of slot is held in position by the adjustable spring 86 so that a tag first engages it just before reaching the end of the previous slot subdivision. That portion of the bottom wall of the receiver nearest the approaching tag is cut away so that the tag engages only the prong 85, which projects out across the center line of the track slot. The forward travel of the tag along the trackway swings the receiver backward against the resistance of the spring 86 until the receiver slot 9 lies in a plane preferably substantially perpendicular to the center line A—A of the track slot at which point the tag has reached the dropping point. If the tag is not of the size to drop through the track slot at this point, or if the tag is still in the carrier, the receiver swings around with the tag until released therefrom, when it springs back into place. If the tag is on the track and of the size to drop through the slot, it falls and the flanged edge 87 of the projecting prong catches under the lug 16. The tag then slips down the edge 87 into the slot 9 where it is supported by both lugs. In order to avoid the chance of the tag slipping off of the edge of the prong, the edge is upturned or flanged as shown in Fig. 4 and the shape of the lug is such that it hooks over this edge. A further influence in this direction is effected by the spring pressed return movement of the receiver, the instant the tag is released from the track and the carrier. That is, during the instant which the tag is supported by its lug engaging the edge 87 of the receiver, the receiver is swinging back against the tag, which has passed downward into the slot 9 before the receiver has completed the recovery movement. By turning the edge 87 of the receiver upward substantially at right angles, the flange provides in addition to the function just explained a broad wearing surface, which is important if the receiver is made of sheet metal.

The receiver is secured to a bracket 88 on the track or frame by a pivotal connection 89 through its top wall. The slot 9 in the bottom wall of the receiver terminates at a point preferably in vertical alinement with the center line of the pivot 89 so that the position of the end of the slot is not changed materially with the swinging of the receiver. The function of the receiver is to catch or receive the tags as they are released from the track and conduct them to the collector 14 which is arranged at an angle to the horizontal below the discharge end of the receiver. The tags sliding down the receiver enter the slot 13 of the collector and slide therein to the lower end. A catch or stop 91 is provided at the lower end which retains the tags within the collector. Preferably the collector is removable from the apparatus and I have found it convenient to support the upper end, Fig. 3, upon an extension 92 of the bracket 88; and the lower end upon a portion 93 of the frame work of the apparatus. The lip 94 on the collector is provided with a hole which engages a pin 95 on the frame work. The collector is removed by lifting the lower end off of the pin and swinging to one side, when the upper end may be withdrawn from the bracket extension 92. The upper end of the slot 13 in the collector is widened out sufficiently to avoid jamming the tags as they discharge from the receiver and the bottom portion of the collector extends under the receiver for a short distance so that a tag discharging from the receiver falls directly upon the collector. The collectors each preferably bear a number corresponding to the number of the tags they are adapted to receive. The collector 14, Fig. 2, receives the second smallest tag of the first division and is therefore given the number 4, since the #4 tags are collected in it.

The counters, (Figs. 2 and 3.)

Preferably a counter 97 is arranged so that the actuating lever 98 is operated by every tag which enters the fifth assorting division. This counter gives the total pieces handled in any given "run." Preferably a counter 99 is also arranged adjacent each collector so that the number of pieces therein may be ascertained. I prefer to actuate the collector counters by utilizing the short fall of the tag from the receiver into the collector to close an electrical circuit which operates the counter.

A lever 101 is pivoted at 102 to an extension 103 of the bracket 88 and is weighted at the end 104 so as to slightly overbalance it and keep the end up against the receiver. As the tag discharges from the receiver 12 it contacts with the lever 101 which gives way and allows the tag to fall upon the underlying end of the collector. As the end of the lever moves downwardly with the falling tag, the integral arm 105 closes the counter circuit 106, through the contact point 107. As soon as the tag slides into the collector, the overbalanced lever 101 returns to normal position.

I may electrically operate both total and collector counters and place them all together, each collector counter being identi-

fied by a number corresponding to the tags and collector to which it relates.

Operation of the apparatus.

A basket of the tagged pieces to be assorted is placed convenient to the hand of the operator who sits at the side of the machine at the loading division. The pieces are taken from the basket one at a time and the tags thereon thrust edgewise and face forward, into the slots 61 of the slowly moving carriers 8 as they pass along the loading division. The operator pushes the tags backward against the guard 48 leaving the attached article hanging below the carrier, as shown in Fig. 3. The guard terminates with the loading division and on entering the seating division the tag shank is engaged by the angularly disposed edge 65 of the track 22 which slides the tag down the sloping edge 64 until the lugs on the tag rest in the seats 62. The carrier then enters the rejection division where the trip 81 ejects from the carrier any tag not properly placed therein. If properly placed the tag is carried past the rejection division and into contact with the counter operating shaft 98 after which the carrier conveys the tag into the fifth assorting division. Assume the tag to be No. 4. It will pass each of the trips 27V, 27IV, 27III and 27II, of the fifth, fourth, third and second assorting division respectively, and will swing each of the receivers in those divisions as it passes by. Since Number 4 tag belongs in the first division it is caught by the trip 27I of that division and swept off of its seat on the carrier, and delivered upon the track. It still is held in the slot 61 of the carrier, however, and is therefore still propelled forward, being prevented from twisting out of the substantially vertical plane by its engagement in the carrier slot between the jaws 7 and the projections 56. Sliding upon the track it finally engages the prong 85 of the receiver 12 as it nears the end of the twenty-third subdivision of the track slot which is subdivision G of the first assorting division. As it enters the twenty-fourth subdivision H the No. 4 receiver is approximately at right angles to the track, and the tag falling through the track slot is caught, one lug 16 engaging over the flanged edge 87 of the receiver. As the receiver returns to normal position the tag slides downwardly through the slot 9 and drops into the collector 14 actuating the operating lever 101 of the counter 99 as it leaves the receiver. It then slides into the catch 91 at the lower end of the collector. After a "run" is completed, the number of pieces in each collector is checked against the memorandum count. A tape is then passed about the pendent bundle of pieces and tied or buckled to hold them all together; the catch 91 is slipped back and the bundle drawn out of the collector. Since they are all at one end of the bundle, the tags are easily and quickly removed from the pieces and thrown into a numbered compartment to await further use upon a new bundle.

I claim:

1. In an assorting apparatus, supporting means attachable to the articles to be assorted, a carrier adapted to carry said supporting means and means for releasing the supporting means from the carrier at predetermined points.

2. In an assorting apparatus, supporting means attachable to the articles to be assorted, a carrier adapted to carry said supporting means and means operated by said supporting means for releasing the supporting means from the carrier.

3. In an assorting apparatus, a track, a carrier movable along the track, supporting means attachable to the articles to be assorted adapted to be carried by the carrier, and means for releasing said supporting means from said carrier onto said track at predetermined points.

4. In an assorting apparatus, a track, a carrier movable along the track, supporting means attachable to the articles to be assorted adapted to be carried by the carrier, and means for transferring the weight of said supporting means from said carrier to said track at predetermined points.

5. In an assorting apparatus, a track, a carrier movable along the track, supporting means attachable to the articles to be assorted adapted to be carried by the carrier, and means operated by said supporting means for transferring the weight of said supporting means and attached article from the carrier to said track at predetermined points.

6. In an assorting apparatus, a track, a carrier movable along the track, supporting means attachable to the articles to be assorted adapted to be carried by the carrier, and means for transferring the weight of said supporting means from said carrier to said track at predetermined points, said track being arranged to drop said supporting means at predetermined points.

7. In an assorting apparatus, a track, a carrier movable along the track, supporting means attachable to the articles to be assorted adapted to be carried by said carrier, means for transferring said supporting means from the carrier to the track and means in said track for releasing said supporting means.

8. In an assorting apparatus, a track, a carrier movable along the track, supporting means attachable to the articles to be assorted adapted to be carried by said carrier, means for transferring said supporting

means from the carrier to the track at predetermined points and means in said track for releasing said supporting means therefrom at predetermined points.

9. In an assorting apparatus, a track, supporting means attachable to the articles to be assorted slidable on said track and means for delivering said supporting means upon said track at predetermined points.

10. In an assorting apparatus, a track, supporting means attachable to the articles to be assorted slidable on said track and means for delivering said supporting means upon said track at predetermined points and propelling said supporting means along said track.

11. In an assorting apparatus, a track, supporting means attachable to the articles to be assorted slidable on said track, means for delivering said supporting means upon said track at predetermined points and propelling said supporting means along said track, and means in said track for releasing said supporting means at predetermined points.

12. In an assorting apparatus, a track, a carrier movable along the track, supporting means attachable to the articles to be assorted adapted to be carried by said carrier, means for transferring said supporting means from the carrier to the track, means in said track for releasing said supporting means at predetermined points, and means for conducting said released supporting means to the collection point corresponding thereto.

13. In an assorting apparatus, a track, a carrier movable along the track, supporting means attachable to the articles to be assorted adapted to be carried by said carrier, means for transferring said supporting means from the carrier to the track, means in said track for releasing said supporting means at predetermined points, and a collector arranged to receive said released supporting means.

14. In an assorting apparatus, a track, a carrier movable along the track, supporting means attachable to the articles to be assorted adapted to be carried by said carrier, means for transferring said supporting means from the carrier to the track at predetermined points, said track being arranged to release said supporting means at predetermined points, and a receiver below said track adapted to catch said released supporting means.

15. In an assorting apparatus, a track, supporting means attachable to the articles to be assorted slidable on said track, means for delivering said supporting means upon said track at predetermined points and propelling said supporting means along said track, said track being arranged to release said supporting means at predetermined points, and a collector arranged to receive said released supporting means adjacent said track.

16. In an assorting apparatus, a track, supporting means attachable to the articles to be assorted slidable on said track, means for delivering said supporting means upon said track at predetermined points and propelling said supporting means along said track, means in said track for releasing said supporting means at predetermined points, a collector for said supporting means arranged adjacent the track, and a receiver adapted to catch the supporting means released from the track and conduct said supporting means to said collector.

17. In an assorting apparatus, a track, a carrier movable along the track, supporting means attachable to the articles to be assorted adapted to be carried by said carrier, and means for transferring said supporting means from the carrier to the track at points determined by the shape of said supporting means.

18. In an assorting apparatus, a track, a carrier movable along the track, supporting means attachable to the articles to be assorted adapted to be carried by said carrier, means for transferring said supporting means from the carrier to the track at points determined by the shape of said supporting means, and means in said track for releasing said supporting means at points determined by its width.

19. In an assorting apparatus, a track, supporting means attachable to the articles to be assorted slidable on said track, and means for delivering said supporting means upon said track at points determined by the shape of said supporting means.

20. In an assorting apparatus, a track, supporting means attachable to the articles to be assorted slidable on said track, means for delivering said supporting means upon said track at points determined by the conformation of the upper portion of said supporting means, said track being arranged to release said supporting means at points determined by the width of said supporting means.

21. In an assorting apparatus, a track, a carrier movable along the track, supporting means attachable to the articles to be assorted adapted to be carried by said carrier and means for transferring said supporting means from the carrier to the track at predetermined points, said track being arranged to release said supporting means at predetermined points and said carrier being adapted to propel said supporting means along said track to said release point.

22. In an assorting apparatus, supporting means attachable to the articles to be

assorted adapted to be conveyed in said apparatus, and mechanism for effecting the discharge of said supporting means from said apparatus at points determined by the shape and the size of said supporting means.

23. In an assorting apparatus, supporting means attachable to the articles to be assorted adapted to be conveyed in said apparatus, individual collectors for the assorted articles, and mechanism for effecting the transference of said supporting means into said collectors at points determined by the shape and the size of said supporting means.

24. In an assorting apparatus, means for identifying and carrying individual articles through said apparatus and means for releasing said identifying and carrying means at points determined by its shape and width.

25. In an assorting apparatus, a track having a slot of varying width, supporting means attachable to the articles to be assorted slidable on said track, and means for delivering said supporting means upon said track at predetermined points and propelling said supporting means along the track, said slot arranged to drop said supporting means at predetermined points.

26. In an assorting apparatus, supporting means attachable to and identifying the articles to be assorted, a conveyer adapted to carry said supporting and identifying means, and means for releasing said means from the conveyer at predetermined points.

27. In an assorting apparatus, a track, an endless conveyer arranged adjacent the track, supporting means attachable to and identifying the articles to be assorted adapted to be carried and propelled along said track by said conveyer, and means for transferring said supporting and identifying means from said conveyer to said track.

28. In an assorting apparatus, a track, an endless conveyer arranged adjacent the track, supporting means attachable to and identifying the articles to be assorted adapted to be carried and propelled along said track by said conveyer, means for transferring said supporting and identifying means from the conveyer to the track and means in said track for releasing said supporting and identifying means therefrom at predetermined points.

29. In an assorting apparatus, a track, an endless conveyer arranged adjacent the track, supporting means attachable to and identifying the articles to be assorted adapted to be carried and propelled along said track by said conveyer, means for transferring said supporting and identifying means from the conveyer to the track at predetermined points, said track arranged to release said supporting and identifying means at predetermined points and a collector arranged adjacent said track for receiving said released supporting and identifying means.

30. In an assorting apparatus, a track having a slot comprising a plurality of assorting divisions, each division comprising a plurality of subdivisions of varying width, supporting means attachable to articles to be assorted slidable on said track, and means for delivering said supporting means upon said track at the beginning of predetermined divisions of said slot.

31. In an assorting apparatus, a track having a slot comprising a plurality of assorting divisions, each division comprising a plurality of subdivisions of varying width, supporting means attachable to articles to be assorted slidable on said track, means for delivering said supporting means upon said track at the beginning of predetermined divisions of said slot, and means for propelling said supporting means along said track.

32. In an assorting apparatus, a track having a slot comprising a plurality of assorting divisions, each division comprising a plurality of subdivisions of varying width, supporting means attachable to articles to be assorted slidable on said track, means for delivering said supporting means upon said track at the beginning of predetermined divisions of said slot, and means for propelling said supporting means along said track, said supporting means being adapted to drop through said slot at points determined by its width.

33. In an assorting apparatus, a track divided into a plurality of assorting divisions, each division comprising a slot of varying width, a conveyer arranged adjacent the assorting divisions, supporting means attachable to articles to be assorted adapted to be carried by said conveyer across said divisions, means for transferring said supporting means from said conveyer to predetermined assorting divisions and means for propelling said supporting means along said division.

34. In an assorting apparatus, a track, supporting means attachable to the articles to be assorted slidable on said track, means for delivering said supporting means upon said track at predetermined points and means for propelling said supporting means along said track.

35. In an assorting apparatus, supporting means attachable to the articles to be assorted adapted to be conveyed in said apparatus, means for effecting the discharge of said supporting means from a predetermined portion of said apparatus and a collector adapted to collect the discharged supporting means and the attached articles in a bundle having all the supporting means at one end.

36. In an assorting apparatus, a track, a carrier movable along the track, supporting means attachable to the articles to be assorted adapted to be carried by said carrier and a trip adjacent to said track adapted to release said supporting means from said carrier whereby it falls upon said track.

37. In an assorting apparatus, a track, a carrier movable along the track, supporting means attachable to the articles to be assorted adapted to be carried by said carrier, and means adjacent said track for releasing from the carrier, supporting means wrongly placed therein.

38. In an assorting apparatus, a track, a carrier having a slot therein movable along the track, supporting means attachable to the articles to be assorted adapted to be carried on said carrier in said slot and means for dropping said supporting means while retained in said slot upon said track.

39. In an assorting apparatus, a track, a carrier having a slot therein movable along the track, supporting means attachable to the articles to be assorted adapted to be carried on said carrier in said slot, means for dropping said supporting means while retained in said slot upon said track at predetermined points, said track being arranged to allow said supporting means to drop therethrough out of the slot in said carrier at predetermined points.

40. In an assorting apparatus, a track having a slot of varying width, a carrier having a slot therein movable along the track, supporting means attachable to the articles to be assorted adapted to be seated on said carrier in said slot centrally over said track slot, and means adjacent the track for unseating said supporting means from said carrier, whereby the supporting means drops upon said slotted track while retained in said carrier slot.

41. In an assorting apparatus, a track, a carrier movable along the track, supporting means attachable to the articles to be assorted adapted to be carried by said carrier, means for releasing said supporting means from the carrier to the track and means for propelling the supporting means along the track.

42. In an assorting apparatus, a track having a slot, a carrier movable along the slot, supporting means attachable to the articles to be assorted adapted to be carried by said carrier, and means for adjusting the supporting means on said carrier.

43. In an assorting apparatus, a track, a carrier having a seat and movable along the track, supporting means attachable to the articles to be assorted adapted to be carried by said carrier, a guard for preventing the placing of said supporting means upon said carrier seat and means adjacent the end of said guard for automatically seating said supporting means in said seat.

44. In an assorting apparatus, a track having a slot, a carrier having a seat arranged above said slot and movable along the slot, supporting means attachable to the articles to be assorted adapted to be carried by said carrier, a guard for preventing the placing of said supporting means upon said carrier seat and means adjacent the end of said guard for automatically seating said supporting means in said seat.

45. In an assorting apparatus, a track, supporting means attachable to the articles to be assorted slidable along the track, said track being arranged to release said supporting means at predetermined points, and a pivotally mounted receiver having a slot therein arranged below the track and adapted to catch the said released supporting means.

46. In an assorting apparatus, a track having a slot of varying width, and a pivotally mounted receiver having a slot therein arranged below the track, the receiver on one side of its slot extending outwardly across the center line of the track slot.

47. In an assorting apparatus, a track, and a receiver having a slotted bottom wall pivotally mounted below the track, the edge of the wall adjacent the slot being flanged.

48. In an assorting apparatus, a track having a slot, and a pivotally mounted receiver having a slotted bottom wall arranged below said track, the receiver on one side of its slot extending outwardly across the center line of the track slot and being provided with a flanged edge.

49. In an assorting apparatus, a receiver having an inclined bottom wall provided with a slot, the edge of the wall adjacent the slot being flanged.

50. In an assorting apparatus, supporting means attachable to the articles to be assorted adapted to be conveyed in said apparatus, means for effecting the release of said supporting means from predetermined points in said apparatus and a detachable collector arranged at each of said points to receive said released means.

51. In an assorting apparatus, a plurality of slotted bottom collectors for the assorted articles and means for distributing the assorted articles into the corresponding collector, said collectors being detachably connected to said apparatus.

52. In an assorting apparatus, supporting means attachable to the articles to be assorted, means for effecting a separation of said supporting means into divisions of related units and means for assorting each division into its units.

53. In an assorting apparatus, supporting

means attachable to the articles to be assorted, means for effecting a separation of said supporting means into divisions of related units, means for assorting each division into its units and means for separately collecting the units of like description.

54. In an assorting apparatus, a carrier having a slot therein and supporting means attachable to the articles to be assorted adapted to be inserted in said slot in one direction only.

55. In an assorting apparatus, an endless conveyer chain, a carrier link in said chain and a carrier pivotally mounted on said carrier link.

56. In an assorting apparatus, an endless conveyer, a carrier pivotally mounted on said conveyer, supporting means attachable to the articles to be assorted adapted to be inserted in said carrier and means for releasing the supporting means from the carrier at a predetermined point.

57. In an assorting apparatus, a track, supporting means attachable to the articles to be assorted slidable on said track, unitary means for delivering said supporting means upon said track and propelling said supporting means along said track and means for maintaining said supporting means on said track in substantially constant angular relation thereto.

58. In an assorting apparatus, supporting means attachable to the articles to be assorted adapted to be conveyed in said apparatus, collectors for each of the supporting means, mechanism for effecting the transfer of said supporting means into said collectors at points determined by the shape and size of said supporting means and a counter arranged to be actuated by said supporting means.

59. In an assorting apparatus, a carrier having a slot therein, a supporting means provided with a lug and attachable to articles to be assorted adapted to be supported in said carrier slot by said lug, said carrier slot being provided with a channel through which said lug is adapted to pass.

60. In an assorting apparatus, a track, supporting means attachable to the articles to be assorted slidable along the track, said track being arranged to release said supporting means at predetermined points, and a receiver arranged adjacent the track and adapted to catch said supporting means after it is released from said track.

61. In an assorting apparatus, a track, supporting means attachable to the articles to be assorted slidable along the track, said track being arranged to release said supporting means at predetermined points, a receiver arranged adjacent the track and adapted to catch said supporting means after it is released from said track and a spring for normally holding said receiver in position.

62. In an assorting apparatus, supporting means attachable to the articles to be assorted adapted to be conveyed in said apparatus, means for effecting the release of said supporting means from predetermined points in a portion of said apparatus and means for receiving said supporting means at said release points and conducting them to a collection point.

In testimony whereof, I have hereunto set my hand at San Francisco, California, this 22d day of May 1916.

DONALD H. PARCE.

In presence of—
C. S. EVANS.