

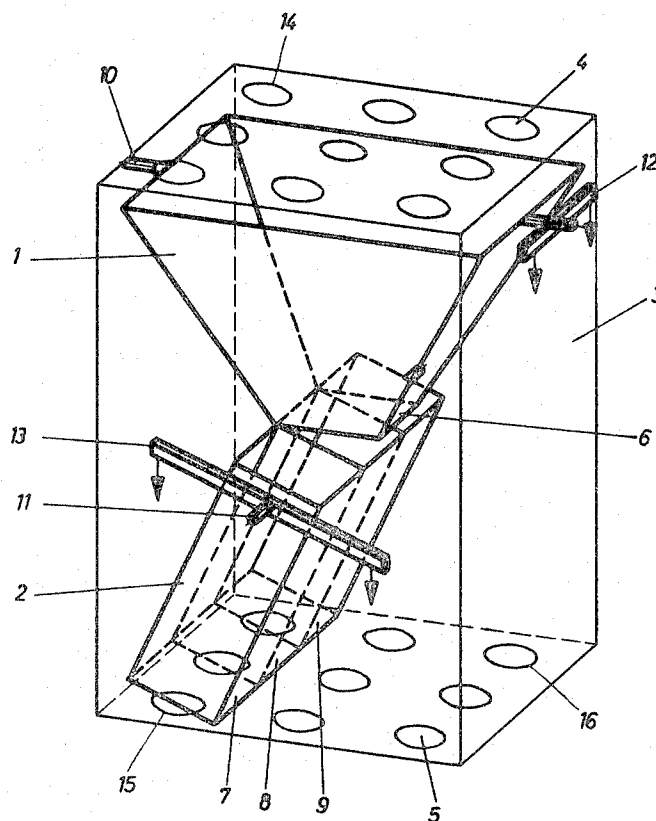
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CENTRAL BRANCH-OFF FACILITY FOR PNEUMATIC TUBE SYSTEMS

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CENTRAL BRANCH-OFF FACILITY FOR PNEUMATIC TUBE SYSTEMS

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This invention relates to pneumatic tube systems, and, more particularly, to a central branch-off facility for the distributive transfer of pneumatic tube carriers between dispatching tubes and receiving tubes.

Known central branch-off equipments require the use of pluralities of guiding components arranged into two planes, one above the other, between the outlets of the dispatching tubes and the entrances of the receiving tubes. In these equipments, the dispatching and receiving tubes are arranged in several rows, side-by-side, forming a system which extends broadly in two coordinates.

The problems attending the known equipments are several; for one, there is the gross and awkward dimension of said structures; as each of the planes has several branches, the volume of these equipments is considerable. Another problem arises from the complication of operation proceeding from the network of necessary control attachments and linkages. Finally, the installation and the maintenance of said structures are burdensome, these structures having—as they do—a great number of operating components.

One object of the applicant's invention, as disclosed herein, is to provide a central branch-off facility which is greatly reduced in volume with a particularly reduced length.

Another object of this invention is to provide a central branch-off facility which requires very simple control mechanism although accommodating broad pluralities of dispatching and receiving tubes.

A further object of this invention is to provide a central branch-off facility which requires a very limited number of operating components.

A principal feature of the invention is the array, in two dimensions and in one plane, of all dispatching tubes addressed to the branch-off facility, and the array of all receiving tubes, also in two dimensions and in one plane, which convey the carriers outgoing therefrom, as well as a simplified re-routing and re-directing of said carriers being passed between said dispatching and receiving tubes. In this, carriers are laterally re-directed along one plane, and then re-directed along a plane which bisects the first plane.

Another feature of the invention is the pivotal mounting of two guiding components, between the dispatching and receiving tubes, so that each component is made to swing in an arc perpendicular to the other, and the provision of simple guiding control mechanism therefor.

The above-mentioned and other features and objects of this invention will become more apparent by reference to the following description taken in conjunction with the accompanying drawing, which is a schematic perspective view, representing a preferred embodiment of the invention for a central branch-off facility.

In the preferred embodiment here illustrated, the branch-off facility has two guiding components 1 and 2, one positioned immediately above the other, and each mounted within a casing 3. Said casing is rectilinear in cross-section, fully closed about the sides, which sides are parallel by pairs, and can either be open-ended at top and bottom, or have plates at top and bottom—with respective apertures 4 and 5 arrayed in two dimensions

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in the plates for the connection, respectively, of dispatching and receiving tubes. The upper guiding component 1, rectilinear in cross-section, is a funnel-shaped member with the wide opening at the top and the narrow neck 6 at the bottom. The lower guiding component 2, also rectilinear in cross-section, has parallel sides; it is formed as a multiple-channel guide, having a plurality of throughgoing channels 7, 8, 9 placed side-by-side, describing generally vertical paths from top to bottom. Each channel is distinct from the others, each being closed about the sides, while each is of the same dimensions as any of the others. Each channel has an opening at the top and an opening at the bottom. Said top and bottom openings are identical in shape and dimensions to the shape and dimensions of the narrow neck 6 of the upper guiding component. The width and length of the opening at the top of the upper guiding component 1 encompasses the total area of the outlet array of dispatching tubes to be accommodated.

Guiding components 1 and 2 are mounted on pivoting means 10 and 11, respectively, which have control levers 12 and 13, respectively, extending therefrom. Each pivoting means is rigidly secured to the extremities of the top of its respective guiding component and pivots at the point of mounting in the casing. Thus, the bottom of each guiding component can swing in an arc. The guiding components are mounted so that their widths are perpendicular to each other, and the pivoting means are pivoted at points of juncture with the walls of the casing so that each guiding component can swing in an arc perpendicular to the other. The plane of the arc described in the swing of one guiding component is normal to the plane of the arc described in the swing of the other guiding component. Each control lever, 12 and 13, is parallel to the pivoting arc of its respective guiding component (1 and 2).

Each control lever, 12 and 13, is connected to resilient means (not shown) so that each is normally held in a center position and its corresponding guiding component, 1 and 2, is held, resiliently, in a center position.

The operation of the central branch-off facility is now explained, with reference to the drawing. Assuming a carrier to be distributively transferred is conveyed by a given dispatching tube, of a plurality of dispatching tubes, to casing 3. Said given dispatching tube will be assumed to be connected with aperture 14 and requires distributive transfer of its input carrier to aperture 15. The carrier passes through aperture 14 into the opening at the top of the upper guiding component 1 and down to the narrow neck 6 of the upper guiding component 1. By applying an external force to control lever 12, to pivot the lever in a clockwise direction, the narrow neck 6 of the upper guiding component 1 is positioned directly above throughgoing channel 7. The lever 13 is shown pivoted in a clockwise direction which positions the opening at the bottom of channel 7 directly above aperture 15. Thus, the carrier passes from the narrow neck 6 of the upper guiding component 1 through channel 7 into aperture 15 whereat a receiving tube, being one of a plurality of receiving tubes which can be connected to apertures 5, can receive the carrier. It can be seen that, by pivoting levers 12 and 13 in counterclockwise directions, a carrier conveyed to aperture 14 can be distributively transferred to aperture 16; in fact, an input at any one of apertures 4 can be transferred to any one of apertures 5 by the selective orientation of guiding components 1 and 2. Any dispatching tube, then, connected to any one of apertures 4 can be addressed to any receiving tube connected to any one of apertures 5.

While I have described the principles of my invention in connection with a specific embodiment, it is to be

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clearly understood that this description is made only by way of example. Other embodiments are possible; for example the casing 1 may be dispensed with and the outlets of the plurality of dispatching tubes can be positioned above the opening at the top of the upper guiding component 1. A plurality of receiving tubes can be positioned below the bottom openings of the throughgoing channels 7, 8 and 9 of the lower guiding component 2, arrayed along the arc described by the swing of said lower guiding component. Therefore, the described embodiment is not a limitation to the scope of my invention, as set forth in the accompanying claims.

I claim:

1. A central branch-off facility for pneumatic tube systems for receiving carriers from dispatching tubes having the exit ports of said tubes distributed in two dimensions and for selectively feeding said carriers to receiving tubes having their input ports also distributed in two dimensions, comprising:

a first means for receiving said carriers from said dispatching tubes and selectively distributing them among output locations arrayed along a line oriented in a first direction, said first means having the general shape of a truncated pyramid and being pivoted about an axis substantially normal to said line;

a second means cooperating with said first means and having a plurality of input points corresponding to said respective output locations of said first means, said second means being adapted for receiving and redirecting said carriers to an output point chosen from a plurality of output points arrayed along a line oriented in a second direction which is normal to said first direction, to distribute said carriers to output points along said line in said second direction; and output means cooperating with said second means and comprising said receiving tubes, including the receiving tube to which the carrier is in each case to be delivered.

2. A central branch-off facility, according to claim 1, wherein:

said first and second means comprise guiding means interposed between said dispatching tubes and said receiving tubes, said guiding means having two cooperating guiding components each with respective pivoting means.

3. A central branch-off facility, according to claim 2, wherein:

said guiding components are mounted one immediately above the other; and

each said pivoting means pivotally mounts its respective guiding component at the extremity of the top of its guiding component, and has a control lever extending from each guiding component at the point of said pivot.

4. A central branch-off facility for pneumatic tube systems for receiving carriers from dispatching tubes having the exit ports of said tube distributed in two dimensions and for selectively feeding said carriers to receiving tubes having their input ports also distributed in two dimensions, comprising:

a casing having input and output apertures formed in either end thereof, said apertures arranged in rows and columns, to accept said dispatching tubes and said receiving tubes thereat, respectively;

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not more than two pivotable guides, positioned between said input and output apertures;

first means, including one of said guides, to selectively direct said carriers from said input apertures to any single row of said output apertures; and second means, including the other of said guides to selectively direct said carriers to any single column of said output apertures.

5. A central branch-off facility, according to claim 4, wherein:

said pivotable guides are mounted on axes perpendicular to each other.

6. A central branch-off facility for pneumatic tube systems for selective distributive transfer of carriers from any one of a plurality of dispatching tubes to any one of a plurality of receiving tubes, comprising:

a casing having a first plurality of apertures for the input connection of said plurality of dispatching tubes and a second plurality of apertures for the output connection of said plurality of receiving tubes;

an upper guiding component, pivotally mounted in said casing, to provide a first direction to said carriers; a lower guiding component, pivotally mounted in said casing, to provide a second direction to said carriers;

said upper guiding component being positioned in immediately proximate relationship to said first plurality of apertures at one end and to said lower guiding component at the other end;

said lower guiding component being positioned in immediately proximate relationship to said upper guiding component at one end and to said second plurality of apertures at the other end; and

control means to pivotally reorient said upper and lower guiding components to impart said first and second directions to said carriers, said carriers being caused to pass serially through both said upper and lower guiding components to accomplish said selective distributive transfer thereof between a given one of said plurality of dispatching tubes and a selected one of said plurality of receiving tubes, wherein:

said upper guiding component is rectilinear in cross-section and is funnel-shaped, having a wide opening at the top and a narrow opening at the bottom;

said lower guiding component is rectilinear in cross-section, having sides which are parallel with a plurality of throughgoing channels, each distinct from the others, placed side-by-side describing generally vertical paths from top to bottom, each channel of said plurality being closed about the sides and having an opening at the top and the bottom; and

said narrow opening of said upper guiding component being substantially identical in shape and dimensions to the shape and dimensions of said top and bottom openings of said channels.

References Cited by the Examiner

FOREIGN PATENTS

665,674 9/1938 Germany.
671,880 2/1939 Germany.

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