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Martin

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[54] **WAITING APPARATUS FOR PNEUMATIC FOR PNEUMATIC DISPATCH SYSTEMS**

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[52] **U.S. Cl.** **243/28,** 243/4

[51] **Int. Cl.** **B65g 51/28**

[58] **Field of Search** 243/2, 3, 4, 16, 243/19, 24, 28, 38

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Assistant Examiner—W. Scott Carson
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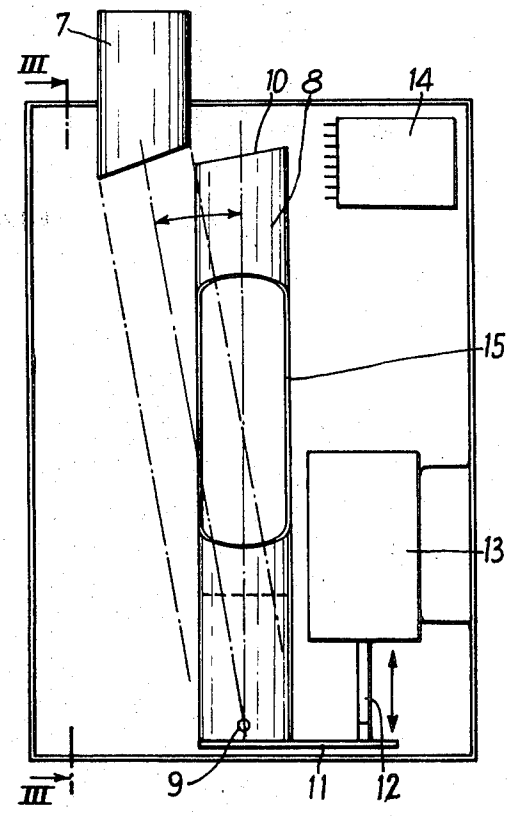
[57] **ABSTRACT**

In a pneumatic tube dispatch system comprising a plurality of receiving and transmitting stations disposed along a main pneumatic line, an apparatus connected through one tube to said line is provided at each station with a substantially vertical movable tube section pivoted at its lower end and adapted to be set in two stable positions, namely a waiting and loading position in which it is adapted to receive a carrier for the message or other object to be transported along said line and an operative position in which it is connected to said one tube, electromagnetic means being provided for controlling the movement of said movable tube section from said waiting position to said operative position, as well as a rotary switch for selecting the address to which the carrier is to be delivered, a lighted push-button for registering this selection and a pilot lamp for warning the operator that the line is free. The movable tube section may be curved in case of larger tube diameters, and adapted to be loaded either laterally or from the top through an opening formed in the cabinet containing the apparatus and adapted to be closed in the operative position thereof by an element carried by said movable tube section.

2 Claims, 6 Drawing Figures



Patented Oct. 23, 1973 3,767,138

Fig:1

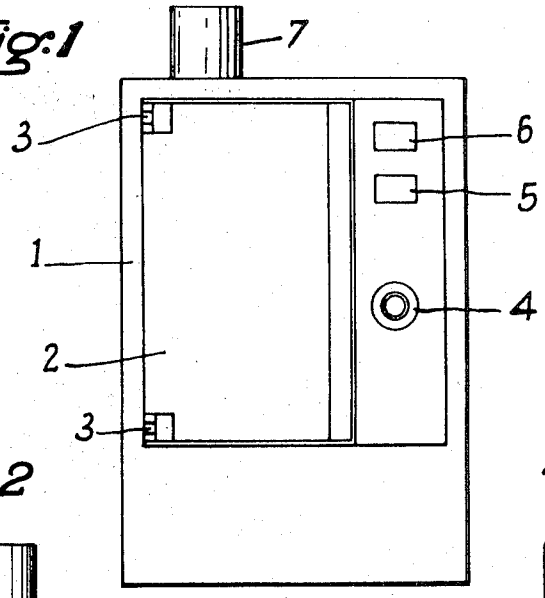


Fig:2

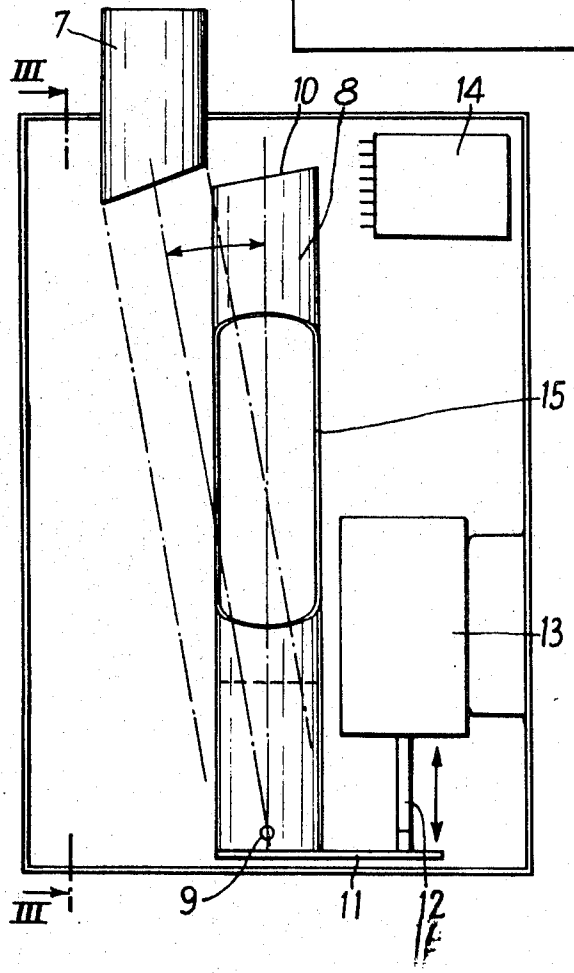


Fig:3

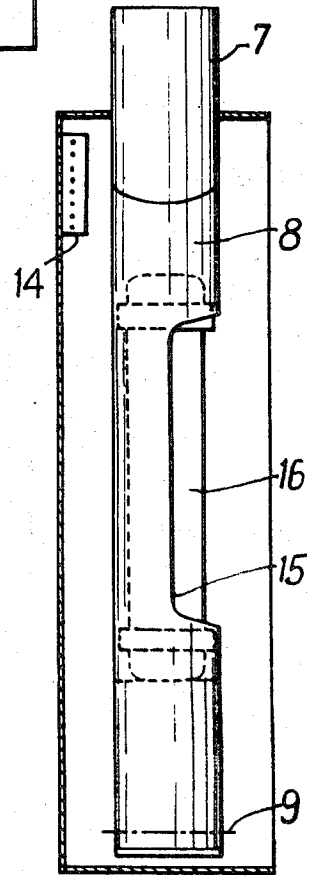


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Fig: 4

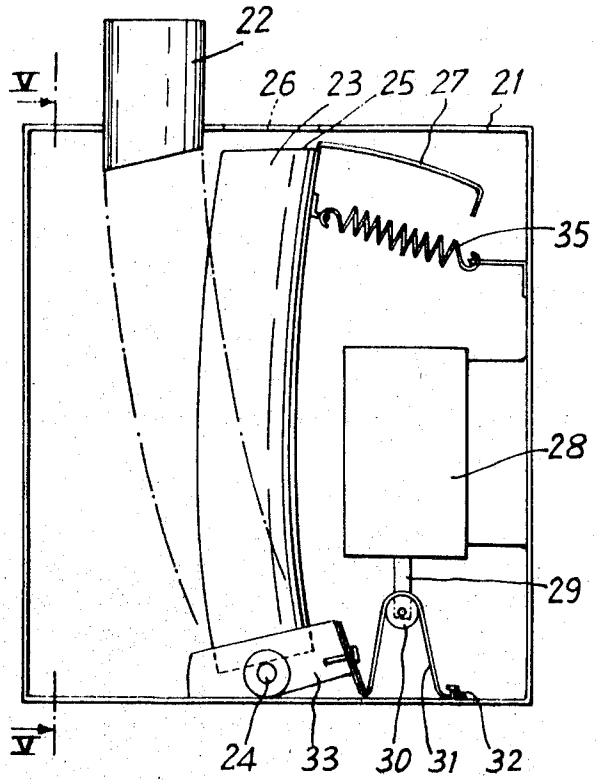


Fig: 5

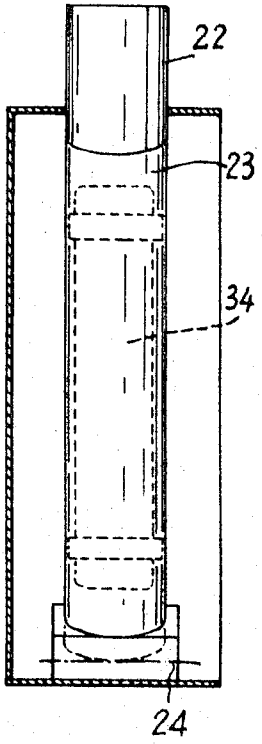
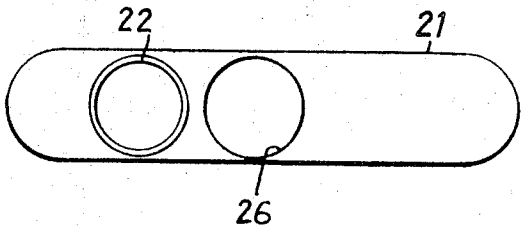


Fig: 6



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WAITING APPARATUS FOR PNEUMATIC FOR PNEUMATIC DISPATCH SYSTEMS

FIELD OF THE INVENTION

This invention relates in general to automatic pneumatic dispatch systems for transporting written dispatches, samples and miscellaneous objects enclosed in a carrier fitting tightly in pneumatic tubes interconnecting a plurality of outlying stations disposed on a same main line.

DESCRIPTION OF THE PRIOR ART

This type of pneumatic dispatch system is objectionable mainly because only one carrier can be transported at a time along the tube. If an operator is desirous to send another carrier while a preceding carrier is still travelling in the tube, he must wait until the preceding carrier has completed its travel before utilizing the line for another carrier. Thus, a considerable loss of time results, especially in long tubes (involving a relatively long travel time) when a particularly dense traffic is maintained or the operator of a same station has to send another carrier.

SUMMARY OF THE INVENTION

It is therefore the essential object of this invention to avoid the inconvenience set forth hereinabove by providing a so-called "waiting" apparatus adapted to eliminate the above-mentioned waiting period for the operator by enabling him to introduce a carrier at the sending station, select an address or receiving station for this carrier by operating a rotary switch, and registering the order so that when the line becomes free the carrier is released immediately.

If a plurality of stations have carriers registered and waiting in the corresponding apparatuses these carriers will be released in the order in which they were registered.

The waiting apparatus according to this invention is also adapted to receive an incoming carrier even if another carrier has already been introduced into this apparatus.

The waiting apparatus according to this invention, which is adapted to be installed at any transmitter/-receiver station, is characterized in that it comprises a movable or pivoted tube section adapted to receive a carrier to be transported from this station, this tube section having two stable positions, namely a waiting or loading position in which the inlet end of the pneumatic tube connected to the general system is free, and an operative position in which the movable tube section is connected to the pneumatic tube, and means whereby, when a carrier to be dispatched has been introduced into said movable tube section and an address has been registered at the aforesaid station, said movable tube section is brought automatically to its operative position, provided of course that the pneumatic transport line is free, so that the carrier can be released.

BRIEF DESCRIPTION OF THE DRAWINGS

In order to afford a clearer understanding of this invention two typical forms of embodiment thereof will now be described by way of example with reference to the attached diagrammatic drawings, in which;

FIG. 1 is a diagrammatical front elevational view of the cabinet enclosing the apparatus of this invention, according to a first form of embodiment;

FIG. 2 is a front elevational view of the same cabinet showing on a somewhat larger scale the principle and mode of operation of the apparatus;

FIG. 3 is a vertical section taken along the line III—III of FIG. 2;

FIG. 4 is a view similar to FIG. 2 but showing a modified form of embodiment of the apparatus;

FIG. 5 is a vertical section taken along the line V—V of FIG. 4, and

FIG. 6 is a plan view from above showing the opening through which the carrier can be introduced into the movable tube section.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The apparatus according to this invention is enclosed preferably in a cabinet 1 (FIGS. 1, 2 and 3) provided with a door 2 mounted by means of hinges 3. This door 2 advantageously consists of transparent, preferably colored, material.

Mounted to the front panel of the cabinet are a rotary switch 4, a lighted push-button 5 and a pilot lamp 6. The switch 4 may provide for example up to 36 positions corresponding to different addresses or receiving stations to which the carriers can be dispatched. Preferably, the push-button 5 is provided with a red pilot lamp and the pilot lamp 6 overlying this push-button may have a different color, for example yellow, and adapted to signal the reception of a carrier at the receiving station.

Opening into the top of cabinet 1 is a pneumatic tube 7 connected to the transport line and directed downwards, the space underlying this tube 7 being normally free to permit the reception of an incoming carrier ejected from the tube 7. In a position normally off-set in relation to the vertical axis of tube 7 is a substantially vertical movable tube section 8 opening upwards and pivoted at its lower end about a horizontal fulcrum pin 9 extending at right angles to the axis of said tube section 8; the upper end 10 of the pivoted tube 8 is shaped to permit its junction with the tube 7 when the tube section has been pivoted to its operative position shown in dash and dot lines in FIG. 2. The base of the movable tube section 8 carries a blade 11 pivoted in turn to the lower end of a rod 12 rigid with a plunger movable within a coil 13 of a control electromagnet adapted, when energized, to move said rod 12 upwards in order to switch the movable tube section 8 from the position shown in thick lines to the position shown in dash and dot lines. The means controlling the electromagnet and the automatic operation of the apparatus comprise relays inserted in printed circuits and connected to the proper terminals of an electrical unit 14 not described in detail herein since it is no part of the present invention. The movable tube section 8 has formed in its front wall portion an opening 15 for inserting a carrier 16 clearly visible in FIG. 3.

The mode of operation of this apparatus will be readily apparent to those conversant with the art and may be summarized briefly as follows:

Assuming that the operator of the station equipped with the apparatus of this invention is requested to dispatch a carrier to another station (the receiving station), he opens the door 2, inserts the carrier through the opening 15 into the movable or pivoting tube 8 so that its upper end is partially engaged into the top portion of this tube 8. Having closed the door 2, the opera-

tor actuates the rotary switch 4 to "dial" the address or reference number of the receiving station to which the carrier 16 is to be dispatched, and then depresses the button 5 in order to cause this address to be duly registered. When the pneumatic line leading to the address thus registered is free, the electric control circuit energizes the electromagnet 13 so as to pull the rod 12 and tilt the movable tube section 8 to the position shown in dash and dot lines in FIG. 2, so that the carrier 16 can be released. The operator can clearly and constantly watch the operating conditions through the transparent door 2. When the carrier 16 has reached the selected station, the pilot lamp 6 lights up to warn the operator that the carrier has been duly received by said station. Immediately as the carrier 16 leaves the transmitting station the electromagnet coil 13 is de-energized so that the movable tube section 8 can be returned by a counterweight or a return spring (not shown) to its initial position shown in thick lines in FIG. 2.

It will be noted that in the inoperative position of said movable tube section 8 the apparatus can receive a carrier ejected from the tube 7 and directed parallel to the movable tube 8.

To ensure a proper coupling of the tubes and permit the passage of the carrier 16, the angle between the axis of the movable tube section 8 and the axis of the fixed tube 7, in the 'starting' position, should be relatively small. However, this requirement is easily met in case of tube sections of relatively small diameter (of the order of, say, 60 mm), and relatively short carriers 16 are used, but with greater tube sections (for example as currently used, 90mm, 110 mm or more) the vertical dimension of cabinet 1 must be increased considerably to permit the starting of the carriers, at least as far as the distance between the fulcrum pin 9 of movable tube section 8 and the junction between this section and the line 7 is concerned. However, this inconvenience can be overcome by resorting to the second form of embodiment if this invention which is illustrated diagrammatically in FIGS. 4 to 6 of the drawings. This modified construction comprises a curved movable tube section 23, with the dual advantage that:

a. the vertical dimension of the apparatus is reduced, and

b. the connection between the movable tube section 23 and the line tube 22 is improved, thus facilitating the starting of the carrier and eliminating (FIG. 4) the angle formed at the junction of the two straight tube sections (FIG. 2).

The apparatus illustrated in FIGS. 4 to 6 is enclosed in a cabinet 21, a pneumatic tube 22 connected to the transport line opening into the top portion of the cabinet; as in the preceding form of embodiment, the space underlying the opening of tube 22 is free to permit the ejection therefrom of the carriers to be received by the station. The movable tube section 23 is curved and its lower end is pivotally mounted about a fulcrum pin 24. This tube has two stable positions, an inoperative, loading and waiting position shown in thick lines in FIG. 4 and wherein the upper open end 25 is off-set with respect to the tube 22 in order to permit the introduction of a carrier 34 into the tube through an opening 26 formed to this end in the top wall of cabinet 21 (FIG. 6), and a starting position illustrated in dash and dot lines in FIG. 4, in which this movable tube 23 is connected to the fixed tube 22. When the movable tube 23 is in this starting position, a plate or lug 27 rigid therewith closes the opening 26 to prevent the insertion of another carrier until the tube 23 has resumed its inoperative position.

The movable tube 23 is responsive to an electromagnet 28 adapted when energized to pull a plunger 29 carrying a pulley 30 tackling a belt section 31 having one end anchored to a fixed point 32 and the opposite end attached to a base member 33 supporting the movable tube 23. This assembly operates in the same manner as the first form of embodiment described hereinabove with reference to FIGS. 1 to 3, except that the movable tube 23 is returned to its inoperative or loading position by a spring 35 interposed between the upper end of this tube and a fixed point of cabinet 21.

In the exemplary form of embodiment illustrated in FIGS. 1 to 3 the carrier is introduced into a lateral notch or opening formed in the movable tube 8, said notch or opening being so shaped as to permit the introduction of the carrier and the engagement of its upper end into the upper portion of the movable tube. Although relatively convenient, with this mode of introduction all the carriers utilized in the apparatus must have the same length. In contrast thereto, by introducing the carriers from the top of the apparatus, as in the form of embodiment illustrated in FIGS. 4 to 6, it is possible to use carriers of different sizes.

Many other variations become obvious in the light of the above disclosure without departing from the scope of the present invention as defined by the claimed subject matter that follows.

I claim:

1. In a pneumatic dispatch system having a network of pneumatic tubes, an apparatus for receiving a carrier in a loading and waiting position and automatically introducing said carrier to said system at an appropriate time comprising a cabinet having a top wall with an opening therein capable of receiving a carrier therethrough and an open end of a fixed tube of said system extending therethrough, an open end tube section pivotally mounted in said cabinet in a position for having said tube section open end in one position coincide with said cabinet top wall opening and in a second position coincide with said fixed tube open end for the dispatch of said carrier, a member connected to and extending laterally of said tube section open end and capable of closing said cabinet top wall opening when said tube section open end coincides with said fixed tube open end whereby a carrier cannot be introduced through said cabinet top wall opening at that time, said tube section being curved along its axis, and electrically operable means connected to said tube section and capable of pivoting said tube section to said carrier dispatch position at the appropriate time.

2. In a pneumatic dispatch system having a network of pneumatic tubes, an apparatus for receiving a carrier in a loading and waiting position and automatically introducing said carrier to said system at an appropriate time comprising an open end tube section pivotally mounted at its other end for pivoting to and from an open end of a fixed tube of said system whereby at times said tube section open end coincides with said fixed tube open end for the dispatch of said carrier into said fixed tube and at other times said tube section is pivoted from said fixed tube open end to the loading and waiting position, a pin connected to and extending perpendicular to the axis of said tube section other end providing the pivotal support for said tube section,

means supporting said pin and electrically operable means connected to said tube section and capable of pivoting said tube section to said carrier dispatch position at the appropriate time, said electrically operable means includes an electro magnet operated plunger, a pulley carried by said plunger, and a belt fixed at one end, extending over said pulley and connected at its other end to said tube section other end whereby activation of said electro-magnet pivots said tube section to coincide with said fixed tube open end.

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