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G. R. COOK

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PNEUMATIC DISPATCH CARRIER

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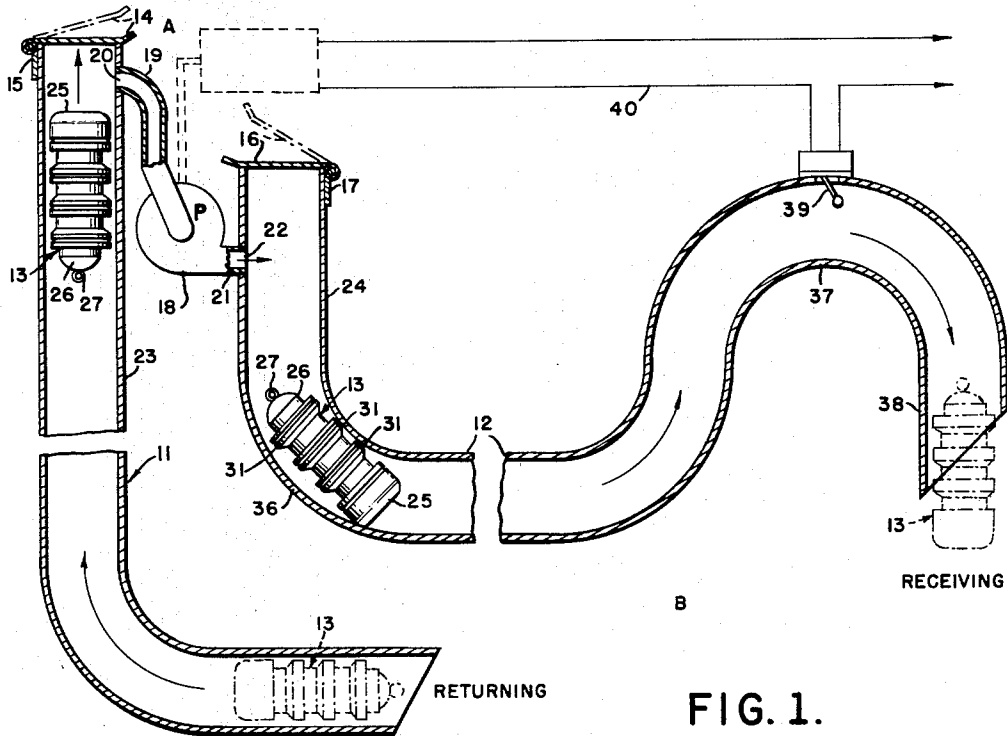


FIG. 1.

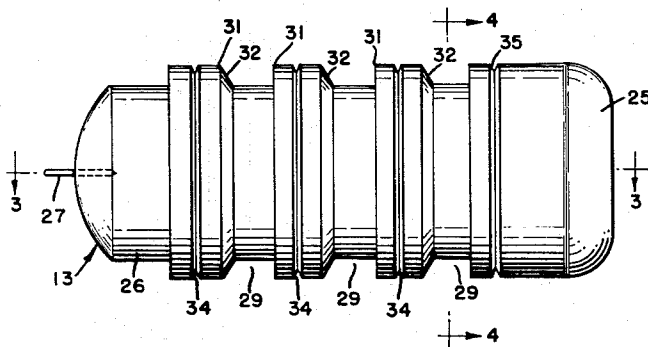


FIG. 2.

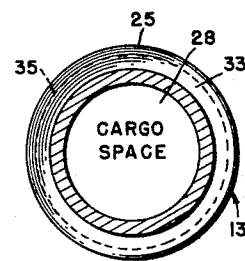


FIG. 4.

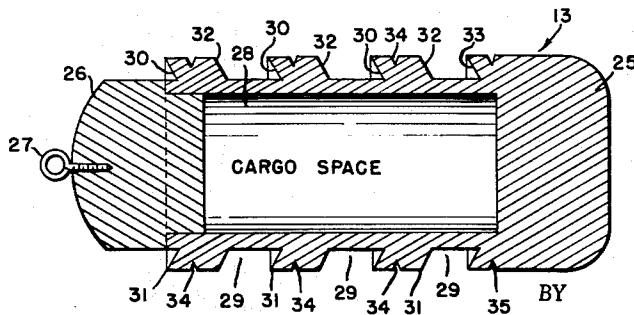


FIG. 3.

INVENTOR
GEORGE R. COOK

Albert J. Kramer

ATTORNEY

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PNEUMATIC DISPATCH CARRIER

George Richard Cook, Hyattsville, Md., assignor to Cookton Pneumatics, Inc., Hyattsville, Md., a corporation of Maryland

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This invention relates to dispatching and it is more particularly concerned with pneumatic dispatch equipment in which carrier capsules are moved between stations through air tubes.

Conventional pneumatic dispatch systems of this kind comprise air tubes extending between transfer stations and carrier capsules that move inside the tubes between the stations. These capsules conventionally are provided with means for forming a seal between them and the tubes, and air under pressure is introduced to the tubes on one side of the capsules to drive them from one station to the next.

The present invention departs from the conventional dispatch systems in that it obviates the need for providing a seal between the capsule and the tube which is an object of the invention.

Another object of the invention is the provision of a pneumatic dispatch system which is capable of functioning under a relatively low pneumatic pressure.

A still further object of the invention is the provision of a pneumatic dispatch system in which the capsule is carried through the tubes by entrainment in a current of air and in which the capsule is urged to assume a coaxial position in the tube under the aerodynamic forces developed by special configurations on the exterior surface of the capsule.

A still further object of the invention is the provision of a pneumatic dispatch system that is relatively easy and simple to use in comparison with conventional systems of the prior art.

These and still further objects of the invention will appear from the following description considered together with the accompanying drawing.

In the drawing:

FIG. 1 is a diagrammatical view of a pneumatic dispatch system in accordance with the invention showing the position of the capsule at various points of the tube.

FIG. 2 is a side elevational view of the carrier on a larger scale apart from the tubes.

FIG. 3 is a longitudinal sectional view along the line 3—3 of FIG. 2.

FIG. 4 is a cross-sectional view along the line 4—4 of FIG. 2.

Referring to the drawing with more particularity the embodiment illustrated comprises a pair of pneumatic tubes 11 and 12 of general circular cross-section and extending between a station A and a station B. The tube 11 is adapted to transmit a dispatch capsule 13 from the station B to the station A and the tube 12 is adapted to transmit or return the capsule from the station A to the station B.

At the station A the tube 11 is provided with an air seal valve or cover 14 which is secured to the end of the tube by a spring hinge 15. A flap valve 16 is secured to the end of the tube 12 at the station A by a spring hinge 17. The hinges bias the valves to the closed position.

Air is passed through the tubes by means of a blower 18. The inlet 19 of the blower is connected to the interior of the tube 11 through an opening 20 in the side of the tube at a distance below the flap valve 14 less than the length of the capsule 13. The outlet 21 of the blower is connected to the interior of the tube 12 through an opening 22 in the side of the tube at a

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distance from the air seal valve 16 less than the length of the capsule 13. The end sections 23 and 24, respectively, of the tubes 11 and 12 at the station A are vertical as shown.

The capsule 13 comprises a hollow cylindrical container having a rounded nose section 25 at its front end, the rear end being open and fitted with a closure plug 26 which is removably held by frictional contact. An eyelet 27 is secured to the plug for supporting it on a rack (not shown) or for holding objects (not shown) that can be carried on the exterior of the capsule instead of utilizing valuable cargo space on the interior 28.

Along the exterior surface of the capsule, a series of spaced annular grooves 29 are provided. These grooves are, in cross-section, shaped like a parallelogram to provide an undercut edge 30 on the rearwardly facing side of the resulting longitudinally spaced annular fins 31. The forward edge 32 of the fins are parallel to the back undercut 30. The back edge 33 of the nose 25 is likewise undercut.

In a transverse plane between the edges 30 and 32 the fins 31 are provided with a relatively shallow annular groove 34. A similar recess 35 is also provided on the nose adjacent the edge 33.

The diameter of the fins and nose section are less than the diameter of the tubes 11 and 12, unlike conventional forms of carrier capsules. With this surface configuration the capsule can be transmitted through tubes of larger diameter by the aerodynamic effect achieved in contacting air flowing through the tubes. For this purpose it is not absolutely essential that the recesses 34 and 35 be provided, but when they are provided they contribute to a greater stability of the capsule, which is desired under the forces of the flowing air, and are especially effective in tending to position the capsule concentrically with respect to the conveyor tubes as it passes therethrough under the force of the flowing air.

The capsule is also able to easily negotiate bends in the conveyor tube as illustrated in FIG. 1 at 36.

The receiving end of the tube 12 may terminate in a U-bend 37 followed by a terminal straight vertical section 38. A micro-switch or magnetic sensor 39 may be inserted in the section 37, as shown schematically, to cut off electrical supply to the blower in a circuit 40, or to indicate the passage of the capsule, or for any other purpose desired as it is conventional in the art.

Having thus described my invention, I claim:

1. In a pneumatic dispatch system having a pneumatic conveyor tube and a carrier capsule for transmission through the tube, said capsule being smaller in diameter than the inside diameter of the tube, means for moving air through the tube in a given direction, said capsule having configurations on its exterior surface to effect aerodynamic propulsion of the capsule through the tube and aerodynamic support of the capsule in disconnected spaced relation to the tube under the influence of the moving air, said configurations being substantially ineffective to cause a sealing of air flow between the capsule and the tube.

2. In a pneumatic dispatch system having a pneumatic conveyor tube and a carrier capsule for transmission through the tube, said capsule being smaller in diameter than the inside diameter of the tube, means for moving air through the tube in a given direction, said capsule having configurations on its exterior surface to effect aerodynamic propulsion of the capsule through the tube under the influence of the moving air and to urge the capsule in disconnected spaced relation to the tube while being so propelled, said configurations being substantially ineffective to cause a sealing of air flow between the capsule and tube.

3. In a pneumatic dispatch system having a pair of

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pneumatic conveyor tubes between two stations, and a capsule for transmission through said tubes, said capsule being smaller in diameter than the inside diameter of the tubes, means for moving air through one tube in one direction and through the other tube in the opposite direction relative to said stations, said capsule having configurations on the exterior surface to effect aerodynamic propulsion of the capsule through the tube and aerodynamic support of the capsule in disconnected spaced relation to the tube under the influence of the moving air, said configurations being substantially ineffective to cause a sealing of air flow between the capsule and tube.

4. In a pneumatic dispatch system having a pair of pneumatic conveyor tubes between two stations, and a capsule for transmission through said tubes, said capsule being smaller in diameter than the inside diameter of the tubes, an air blower having a suction inlet and a pressure outlet, said inlet being connected to one tube at one station and said outlet being connected to the other tube at the same station, said capsule having configurations on its exterior surface to effect aerodynamic propulsion of the capsule under the influence of air moving in said tubes and positioning of the capsule in disconnected spaced relation to the tubes while being propelled aerodynamically therethrough, said configurations being substantially ineffective to cause a sealing of air flow between the capsule and the tube.

5. An aerodynamic carrier for a pneumatic dispatch system, said carrier comprising a hollow cylindrical capsule adapted to be disposed longitudinally in a pneumatic tube of a larger interior diameter, said carrier having aerodynamic configurations on its exterior surface comprising an annular projection extending radially from the body of the carrier, the side of the projection facing one end of the capsule being undercut, the opposite side of said projection being parallel to the said undercut side, said carrier being adapted for movement through said tube in disconnected spaced relation thereto, said configurations being substantially ineffective to cause a sealing of air flow between the capsule and tube.

6. An aerodynamic carrier as defined by claim 5 having a plurality of the projections on the body in longitudinally spaced relation.

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7. An aerodynamic carrier as defined by claim 5 in which the annular projection has an annular groove between said sides.

8. An aerodynamic carrier as defined by claim 7 in which the depth of the annular groove is less than the radial thickness of the projections.

9. The method of transmitting an object of given diameter through a tube of larger diameter between spaced apart stations comprising moving a stream of air through the tube from one of the stations, presented as a first station, to the other station, inserting the object in the tube at the first station and permitting the moving air to act upon the object in the direction of said other station, and to flow between the object and the tube while aerodynamically supporting the object in spaced relation to the tube until it reaches the said other station.

10. The method comprising passing a stream of air through a tube, inserting in the stream of air an object to be carried through the tube and aerodynamically supporting the object in the stream of air in spaced relation to the tube while permitting the stream of air to flow through the space between the tube and object.

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SAMUEL F. COLEMAN, *Primary Examiner*.

ANDRES H. NIELSEN, *Examiner*.