Oct. 21, 1930. C. W. GROVER 1,779,164

CARRIER FOR PNEUMATIC TUBE CARRIER SYSTEMS

Filed May 29, 1929

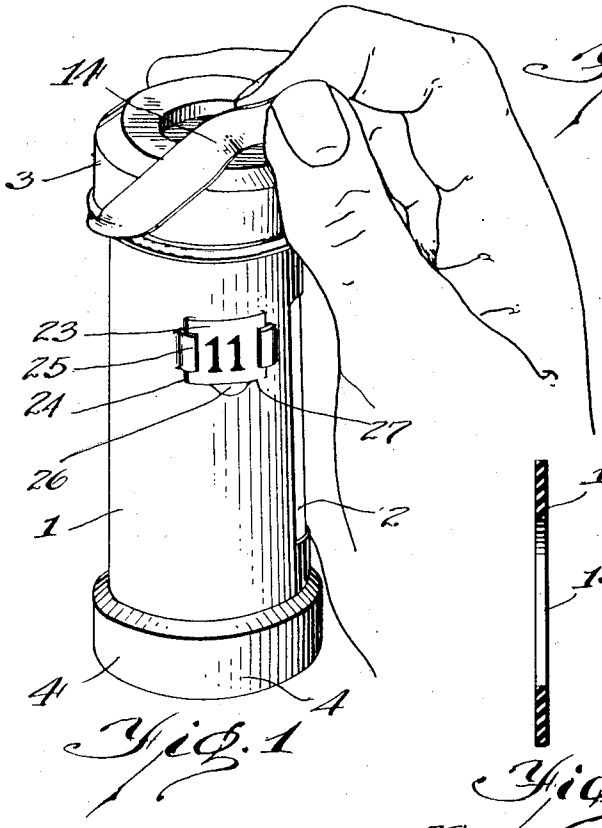


Fig. 1

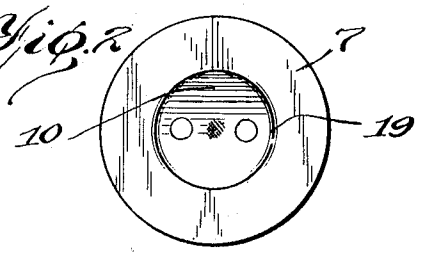


Fig. 2

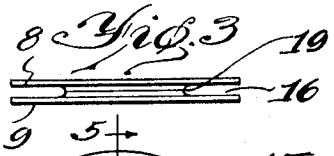


Fig. 3

Fig. 5

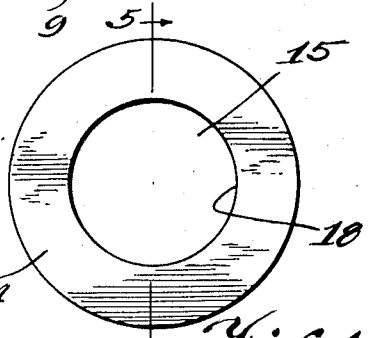


Fig. 4

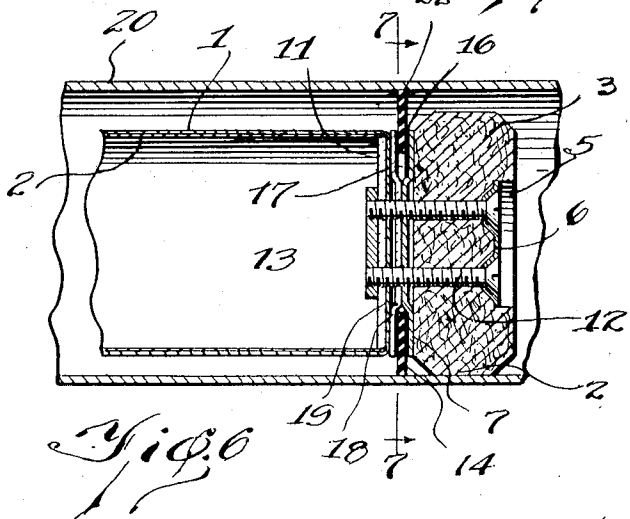


Fig. 6

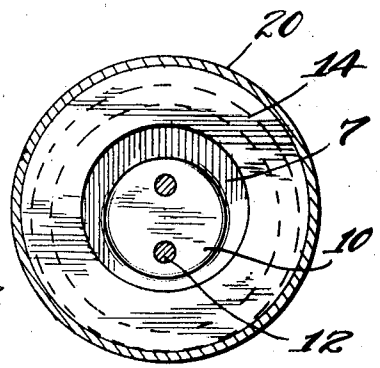


Fig. 7

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UNITED STATES PATENT OFFICE

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CARRIER FOR PNEUMATIC-TUBE-CARRIER SYSTEMS

Application filed May 29, 1929. Serial No. 366,853.

This invention relates to a carrier for a pneumatic tube carrier system. Pneumatic tube cash and message carrier systems are old in the art and have a wide spread use in department stores and other such places where cash or messages are to be dispatched from one part of the store to another. For the purpose of sending cash from one part of the store to another there is usually provided a receiving terminal from which numerous tubes run to various parts of the store. Suitable means are used to maintain a vacuum in these tubes. When it is desired to send cash from one part of the store to the receiving terminal, the cash is enclosed in what is known as a cash carrier which is a cylindrical body having a felt head at each end and a rubber disc fixed between the one felt head and the adjacent end of the cylindrical shell, and then the cash carrier is placed into one of the vacuum tubes. The rubber disc is used to effect an air-tight seal with the tube and consequently the vacuum causes the cash carrier to be propelled to the receiving terminal.

The cash carrier is usually made of a metal such as brass. When the cash carrier is inserted in the vacuum tube, almost all of its weight is supported by the rubber disc. This causes the portion of the disc upon which the carrier rests to bend which results in a crescent-shaped opening between the upper portion of the tube and the upper portion of the disc. This opening allows the air to flow by the disc and consequently the propulsion of the cash carrier through the vacuum tube is either rendered very inefficient or entirely prevented.

Among the types of power control is that known as the minimum flow type. In this type the vacuum in the tube, when the tube is not in use, is very small but upon the insertion of a cash carrier into the tube, owing to the seal created by the rubber disc with the tube, the minimum vacuum is gradually increased until it reaches a certain strength, at which time a regulating valve on the vacuum pressure tank is automatically thrown open to effect a maximum vacuum in the tube. In the minimum flow type of power control it is very essential that a substantially perfect seal should be maintained between the tube and the rubber disc on the cash carrier otherwise there will be no increase in the vacuum and therefore no consequent automatic throwing on of the regulating valve to effect a maximum vacuum.

It is customary to secure the rubber disc between the cash carrier shell and the head in a fixed relation so that of necessity the greater part of the weight of the shell is borne by the rubber disc. It is the object of this invention to obviate the above outlined disadvantages of this method of mounting of the disc and this is achieved by producing a cash carrier having a floating disc i. e., a disc which is free to move radially and which at all times during operation rides upon its edge and supports only its own weight thereby maintaining a substantially air-tight seal with the tube.

It is also the object of this invention to present a floating air disc which is readily replaceable without the necessity of loosening or removing any screw or part of the cash carrier and without using a tool of any kind.

In the drawings:

Fig. 1 is a perspective of the cash carrier which shows the operator in the act of removing the floating disc.

Fig. 2 is an elevation of the holder into which the disc fits.

Fig. 3 is a plan view of the disc holder shown in Fig. 2.

Fig. 4 is an elevation of the floating air disc.

Fig. 5 is a section along the line 5—5 of Fig. 4.

Fig. 6 is a sectional view showing the cash carrier in a vacuum tube.

Fig. 7 is a section along the line 7—7 of Fig. 6.

Referring more particularly to the drawings, the cash carrier consists of the outer cylindrical shell 1 and the inner cylindrical shell 2 which are relatively rotatable one within the other. The cash carrier has at one end the felt head 3 and at the other end the felt head 4 which are the same in structure.

The felt head 3 has the recess 5 in which is placed the apertured disc washer 6. The felt head 3 is arranged to be secured to the end of the outer shell 1 and felt head 4 to the end of the inner shell 2.

Mounted intermediate the shell 1 and the felt head 3 is the air disc holder 7 which consists of the complementary metal discs 8 and 9 which are counter-sunk as at 10. The counter-sunk discs 8 and 9 are fixed together by spot-welding or in any other suitable manner. Within the outer shell is placed the apertured disc 11. Suitable screws 12 pass through the apertures in the washer 6, the felt head 3, the holder 7, the end of the cylindrical shell 1, and screw into the nut 13 thereby fixing the holder 7 and felt head 3 in assembled relation with the outer shell 1.

As shown in Figs. 4 and 5, the floating air disc consists of the ring-like rubber disc 14 which has a large central opening 15.

To assemble the floating air disc to the cash carrier, the disc 14, owing to its elasticity, may be drawn over the felt head 3 and inserted in the groove 16 of the holder 7. When it is desirable to replace the floating air disc 14, it can be removed as shown in Fig. 1 by simply drawing it over the felt head 3. There is no necessity for using any type of tool or removing any parts of the cash carrier since the operation is entirely manual.

As shown in Fig. 6, there is a substantial clearance 17 between the inner periphery 18 of the floating air disc and the inner periphery 19 of the air disc holder. This allows the rubber washer to be in a floating relation with the holder, consequently, when the cash carrier is placed within the vacuum air tube 20 (Fig. 6), the entire weight of the cash carrier will be supported by the felt heads 3 and 4 which rest upon the vacuum air tube as at 21. It will be noted that the floating air disc 14 has a substantially air-tight seal as at 22 with the air tube 20 owing to the fact that the air disc 14 is in floating relation with the metal disc socket. Hence, the air disc 14 rides on its edge and has only its own weight to support which is insufficient to bend over the lower edge to create a crescent shaped opening between the upper portion of the air tube and the disc.

For purposes of identification, the cash carrier is provided with the number tab 23. The outer shell 1 is provided with a square opening 24 and the struck-out lugs 25. The tab 23 rests upon, and slidably engages, the inner shell 2. When it is desired to replace the tab 23, a knife is inserted in the recess 26, and the tab raised sufficiently to clear the lower edge 27 of the aperture 24 in the outer shell. At this time the tab may be pushed downward by the thumb and will readily slide from under the lugs 25. To replace the tab it is only necessary to slide the tab under the lugs 25 which will securely hold it within the aperture 24.

It is evident from the above description that there is here produced a cash carrier having a floating air disc that will at all times effect a substantially air-tight seal with the vacuum air tube. It is understood that this type of carrier with a floating air disc is not limited to use in a vacuum tube, but may be equally well used in any type of pneumatic tube such as that using positive air pressure.

What I claim is:

1. A carrier for a pneumatic tube carrier system, having in combination a body portion, a head having a relatively low coefficient of friction for supporting the body and of such size as to receive the main driving fluid pressure, a holder having a circumferential groove and an easily distortable washer for the said groove, the said washer having an inner periphery larger than the inner periphery of the said groove whereby the washer is radially adjustable relative to the said holder.

2. A carrier for a pneumatic tube carrier system, having in combination, a body portion, a head having a relatively low coefficient of friction for supporting the body and of such size as to receive the main driving fluid pressure, a double disc holder having spaced outer peripheral portions, and a loosely fitting distortable washer for the spaced peripheral portions of said holder whereby the washer is free to adjust itself eccentrically relative to the center of said holder.

3. A carrier for a pneumatic tube carrier system, having in combination, a body portion, a pair of counter-sunk discs mounted back to back on the said body portion, and a washer fitted loosely between the said discs having a greater periphery than that of the body portion.

4. In a pneumatic tube carrier system, the combination of a tube, a carrier arranged to fit loosely within, and to be propelled through, the said tube by pneumatic pressure, said carrier having a felt head for supporting the carrier in the tube and of such size as to receive the main propelling fluid pressure, and floating means for the said carrier for effecting a substantially air-tight seal with the said tube.

5. In a pneumatic tube carrier system, the combination of a tube, a carrier having a smaller diameter than that of the tube arranged to be propelled through the said tube by pneumatic pressure, said carrier having a felt head for supporting the carrier in the tube and of such size as to receive the main propelling fluid pressure, and resilient floating means for the said carrier supporting its own weight alone for effecting a substantially air-tight seal with the said tube.

6. In a pneumatic tube carrier system, the combination of a tube, carrier means arranged to fit loosely within and to be propelled through, the said tube by pneumatic pressure, said carrier having a felt head for supporting the carrier in the tube and of such size as to receive the main propelling fluid pressure, and a rubber disc in floating relation with the said carrier whereby radial adjustment is permitted for effecting a substantially air-tight seal with the said tube, said disc bearing its own weight alone and serving merely to prevent air-leakage between the felt head and the tube.

7. A carrier for a pneumatic tube carrier system, having in combination, a body portion, a head portion, and an elastic air disc washer for said carrier arranged to be drawn over the said head portion and snapped into position without removing said head portion from the said body portion.

In testimony whereof I affix my signature.

CLARENCE W. GROVER.