

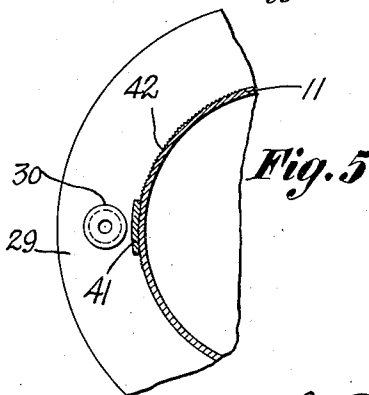
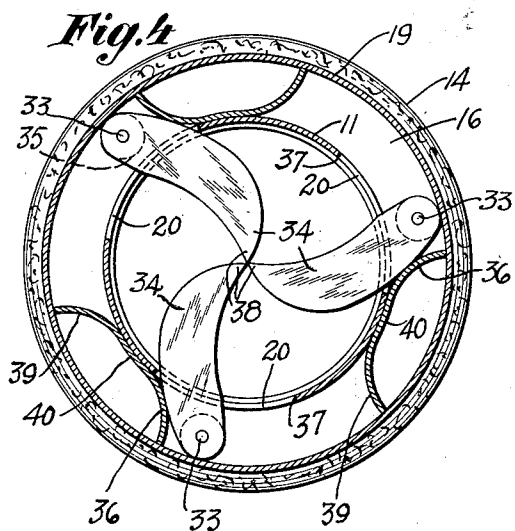
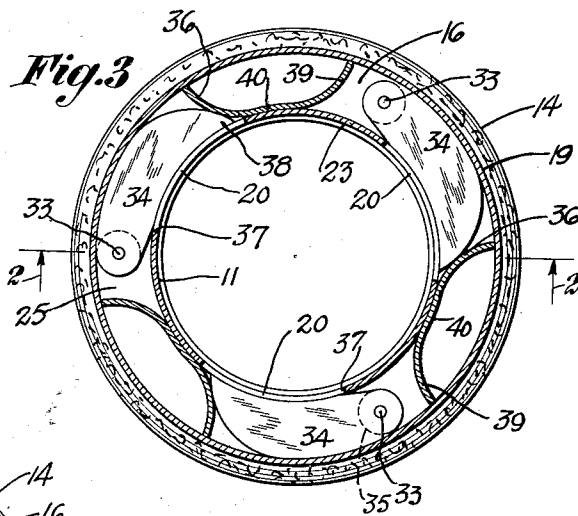
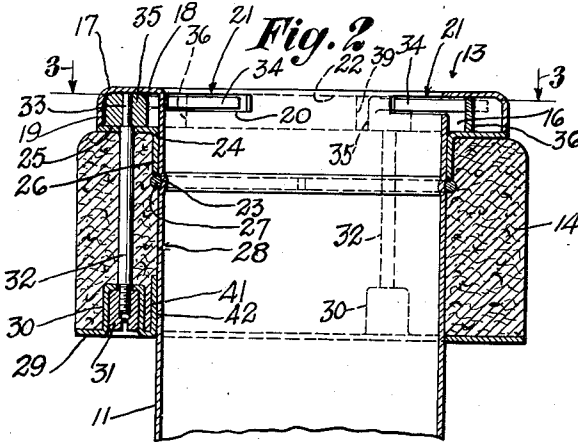
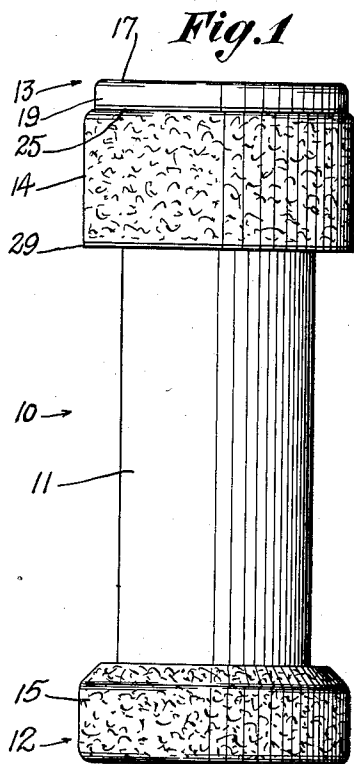
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PNEUMATIC CARRIER

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PNEUMATIC CARRIER

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16 Claims. (Cl. 243—35)

This invention relates to devices such as carriers for pneumatic systems that are used in the transmission of articles, such as papers and the like.

5 One object of the invention is to provide a device of the character described having improved means for holding articles or papers of varying lengths including lengths greater than that of the carrier compartment without necessitating that the articles or papers be distorted or otherwise reduced in length to conform to the length of the carrier compartment; and another object of the invention is to provide a carrier for a pneumatic system, which carrier shall have improved means for holding or gripping an article or paper disposed in the carrier irrespective of the diameter or bulk of the article or paper.

10 Another object of the invention is to furnish a device of the nature set forth wherein a carrier for a pneumatic system includes a closure, and improved means for actuating the same, or for actuating any holding means for an article or paper in the carrier; and another object of the invention is to cause the actuating means to be controlled by a movable piston ring of the carrier, which ring may be movable in the sense that its relation to the carrier tube may be altered.

15 Another object of the invention is to construct a carrier for a pneumatic system, having laterally movable or contractible means for releasably gripping an article or object and maintaining the same in general central alignment with the carrier of the tube, particularly if the article or object projects from the tube.

20 A further object of the invention is to provide a device of the type mentioned having relatively few and simple parts, and which is inexpensive to manufacture, neat, compact, durable, reliable and efficient in use, and which can be applied to standard or conventional pneumatic systems.

25 Other objects and advantages of the invention will become apparent as the specification proceeds.

30 With the aforesaid objects in view, the invention consists in the novel combinations and arrangements of parts hereinafter described in their preferred embodiments, pointed out in the subjoined claims, and illustrated in the annexed drawing, wherein like parts are designated by the same reference characters throughout the several views.

In the drawing:

35 Figure 1 is a view in side elevation showing a device embodying the invention.

Fig. 2 is an enlarged fragmentary vertical sectional view thereof taken on line 2—2 of Fig. 3, the article holding means being retracted.

Fig. 3 is a horizontal sectional view taken on line 3—3 of Fig. 2, with the article holding means retracted.

Fig. 4 is a view similar to Fig. 3 but showing the article holding means in maximum projected or contracted position.

Fig. 5 is a fragmentary horizontal sectional view of the tube and the lower anchor ring for the top piston element, showing a frictional locking means.

The advantages of the invention as here outlined are best realized when all of its features and instrumentalities are combined in one and the same structure, but, useful devices may be produced embodying less than the whole.

It will be obvious to those skilled in the art to which the invention appertains, that the same may be incorporated in several different constructions. The accompanying drawing, therefore, is submitted merely as showing the preferred exemplification of the invention.

Referring in detail to the drawing, 10 denotes a holding device that can be used in a stationary as well as in a movable manner, but is illustrated to the best advantage as a carrier element of a movable, and preferably a pneumatic system.

The device 10 may include generally a container or tube 11, made of metal, leather, and the like, closed in any suitable manner at one end 12, and open or adapted to be opened at its upper end 13 so that articles or papers may be inserted into the tube and retained therein in the course of the travel of the carrier through the pipes or ducts of the pneumatic system. The device 10 may also include external piston portions or sealing rings or elements such as 14, 15 disposed at the upper and lower ends of the tube, respectively, whereby the difference of pressure in the pneumatic system will actuate the carrier, and without permitting portions of the tube to come into contact with said pipes, especially at bends thereof. The elements 14, 15 may consist of any material suitable for sealing action, and may be made, for instance, of felt. As so far described, the construction of the carrier may be conventional.

The tube 11 may have at its upper end a suitable annular compartment 16. The latter may be provided by a channel formation 17, that may desirably be integral with the tube 11, and which may include an annular flange 18 bent outwardly from the tube, and a reversely bent cylindrical flange 19 extending from the flange 18. Com-

communicating with the compartment 16 are one or more openings or slots 20 which may be of equal length and equally angularly spaced from each other. These slots may have their upper edges 5 21 in the plane of the inside face 22 of the wall 18. At a suitable distance below the slots, the tube may be formed with an external holding means such as an annular groove portion 23, which can thus be readily pressed into the tube 10 wall.

For closing the compartment 16, an angle shaped ring 24 may be used, which may have annular flanges 25, 26, the first being adapted to seat on the edge of the flange 19, and the latter 15 to be snugly slidable along the tube 11. To releasably hold the ring 24 in compartment closing position, a split, resilient ring 27 may be snapped into the groove 23 in position to tightly abut the adjacent edge of the flange 26.

The piston 14 rests against the angle member 24 and slidably embraces the tube 11 at the surface 28. At the lower edge of the piston, a retaining ring 29 may be provided lying generally in a plane, but having a plurality of upwardly recessed portions 30 removably set into corresponding openings in the piston 14, and said recessed portions being adapted to individually receive nuts 31 for bolts 32. The latter are equal in number with the slots 20 and extend through elongated holes in the piston 14 parallel to the axis thereof. At its lower end, each bolt may have an undercut stop portion extending through a central hole of the recessed portion into threaded connection with the nut 31. At its upper end 35 each bolt may be suitably secured to the ring 24, preferably by extending through and being welded or soldered to the flange 25. In this manner the piston 14 is securely held in position and may be readily removed from position by disconnecting the nuts 31, so that the ring 29 and hence the piston 14 can be slid downward along the tube 40 11. Moreover, access may be had to the compartment 16, by forcing the ring 27 downward, so that the ring 24 can be moved correspondingly.

It will be further noted that the elements 24, 14, and 29, with their interconnecting bolts form a unit which is journaled in the tube 11 for angular motion about the axis thereof. The element 24 will slide along the ring 27, and the piston 14 50 will frictionally engage said tube, and such engagement may be adjusted by tightening the nuts 31. By thus deforming the piston, the engagement thereof with the pipes of the pneumatic system may be adjusted. However, the adjustments mentioned are not a necessary part of the invention.

In the compartment 16 a plurality of angularly movable stub shafts or pivot pins 33 may be provided, in association with the slots 20, and said pins may be secured to the ring 24 by constituting end portions of the bolts 32 extending into the compartment. On each of these pins is mounted a swingable means such as a finger or pawl 34 65 aligned with an adjacent slot 20 for movement therethrough along the surface 22 of the compartment wall 18. These fingers extend in the same angular direction and each may have a bearing head 35 journaled on its respective pin 33 and resting on the flange 25, to support the finger at the required elevation. It will be evident that the fingers constitutes a circular series angularly movable along the compartment under actuation of the pins 33, and hence of the unit 24, 14, 29.

Coacting with the fingers 34 are actuating 75 means responsive to the angular movement of the

fingers, such as cams 36 with which the outer curved faces of the fingers may have wiping contact. It is thus seen that if the series of fingers is turned clockwise, the fingers are all simultaneously and equally swung inward by the cams to 5 pass through the slots 20 and to enter the tube 11 along a common plane. It will be observed that the swinging motion of the fingers from initial position can occur only if the angular motion concurs therewith, since in the initial position, the wall of the tube 11, as indicated at the ends 37 of the slots engages the fingers to retain the same wholly within the compartment 16, whereby accidental projection of the fingers and obstruction thereby of the tube passage is prevented. When projection of the fingers has once 15 begun, the same may swing inward freely, but such motion is opposed by the articles or papers in the tube 11, gripped by the ends or points 38 of the fingers, so that the swinging motion is controlled mainly by the cams 36. 20

In order to limit the angular motion of the fingers 34, stops 39 may be provided adjacent to the hubs 35 of the different fingers. Thus in retracting the fingers, angular motion may occur 25 until these hubs strike the stops, and in projecting the fingers the angular motion is away from the stops as shown in Fig. 3, according to which a small angular motion may be had before the projecting or after the position of full retraction 30 is obtained, as the case may be, whereby the fingers may be reliably locked against accidental movement from the compartment 16.

Desirably one of the cams 36 and one of the stops 39 may be of integral construction, as a 35 one piece element 40 extending the full height of the compartment 16, and between the wall 11 and the flange 19, and suitably rigidly connected to proper stationary portions of the compartment.

If additional locking or frictional means be desired to assure that the fingers 34 will be maintained in a set position, and in the event that the frictional engagement between the piston 14 and the tube 11 at the surface 28 be insufficient, or is 45 subject to wear, one of the rings 17, 29, such as the latter may have a spring tongue 41 bent upward underneath the piston 14 and arranged for frictional contact with a roughened or grooved external surface 42 of the tube 11. 50

The manner of using the device will now be described. With the holding means 34 of the carrier 10 in the retracted position shown in Fig. 2, any papers or articles are quickly and freely inserted into the tube 11. The operator then, with 55 a single rapid motion, grasps and turns the piston 14, operating the actuating means for causing projection and contraction of the holding means about the papers or articles. A reasonable turning pressure is sufficient, and the device is frictionally retained set. The holding means engages around the papers or articles if the same project 60 from the tube, and hold such projecting portion tightly and in substantial alignment with the tube. If the papers or articles be sufficiently short to be wholly received in the tube, the holding means may be completely closed as shown in Fig. 4. But whether the articles be long or short, they may be gripped by the holding means and 65 thus held against loss or movement relative to the tube, while the carrier travels through the pneumatic system. The arrangement and proportions of the parts of the carrier may of course be such as to facilitate the travel thereof unobstructedly along the curves and bends of the 75

system, and this result is aided by the centralized holding of an article that projects from the tube. When it is desired to remove the article from the tube, a short reverse turning motion of the piston 14 completely retracts the fingers 34.

It will be understood that the holding means may be variously operated, although the piston 14 affords a particularly convenient handhold for this purpose; and likewise, various holding or closure devices may be operated by a movement of the piston 14.

It will be appreciated that various changes and modifications may be made in the device as shown in the drawing, and that the same is submitted in an illustrative and not in a limiting sense, the scope of the invention being defined in the following claims.

I claim:

1. A device including an open ended carrier for pneumatic systems, said carrier having a rotary piston coaxial therewith and adapted to have its relation to the carrier coaxially changed, and means movable laterally to the carrier for holding an article in the carrier, said means being controlled by said piston and being retained by the latter in different lateral positions.

2. A carrier for pneumatic systems including a tube, and means mounted on the carrier for holding an article therein, said means being contractible with respect to the tube axis for engaging and gripping around an article received in the tube.

3. A carrier for pneumatic systems including a container having an opening at one end thereof, and contractible means at said opening for engaging and retaining an article in the container, said means being movable transversely of said opening, said end of the container being otherwise permanently open, and said container having a piston head movably mounted thereon for actuating the contractible means.

4. A piston carrier for pneumatic systems including movable means for laterally engaging an article in the carrier, means for actuating and setting the movable means in different positions for engaging the article, and a movable piston for controlling the actuating means.

5. A carrier for pneumatic systems including means for movably engaging around an article in the carrier, and means for actuating the first mentioned means.

6. A carrier for pneumatic systems including means for centrally compressing and engaging an article in the carrier, so that the article is maintained in substantially aligned relation with the carrier.

7. A carrier for pneumatic systems including a tube, laterally movable means on the carrier for retaining articles of different sizes in the tube, and angularly movable means coaxial with the carrier for actuating the laterally movable means.

8. A carrier for pneumatic systems including a tube, movable means on the carrier adapted to be set for retaining an article in the tube, differently movable actuator means for the movable means, and means frictionally engaging the carrier for maintaining the actuator means in set position.

9. A carrier for pneumatic systems including a tube, laterally movable means thereon for retaining an article against release from the tube,

and actuator means for the movable means, including means journaled on the tube and having frictional engagement therewith.

10. A carrier for pneumatic systems including a tube having an element disposed along a wall of the tube and actuable to swing inward from said wall for engaging an article against release from the tube, and cam means for actuating said element, the latter and the cam means being arranged for relative angular movement about the axis of the tube.

11. A carrier for pneumatic systems including means for movably engaging around an article in the carrier, means coordinated with the first mentioned means for relative movement therebetween to actuate the latter, and a rotary piston for actuating the first mentioned means.

12. A carrier for pneumatic systems including means for centrally compressing and engaging an article in the carrier to maintain the article in substantial alignment with the carrier, cam means coordinated with the first mentioned means for relative movement therebetween to actuate the latter, and a piston movable on the carrier for actuating the first mentioned means.

13. A carrier for pneumatic systems including a tube having an element disposed along a wall of the tube and actuable to swing inward from said wall for engaging an article against release from the tube, and cam means for actuating said element, the latter and the cam means being arranged for relative angular movement about the axis of the tube, and the carrier having a piston movable about said axis for controlling said relative movement.

14. A carrier for pneumatic systems including a tube having an annular outside compartment at one end thereof, a piston ring journaled on the tube, movable means adjacent to said compartment for projection into the tube and for retraction into the compartment, actuator means in the compartment for the movable means, and means interconnecting the piston ring and the actuator means for operation of the latter by the former.

15. A carrier for pneumatic systems including a tube having an arcuate compartment extending coaxially along the outside thereof, said compartment and tube having an opening therebetween, article holding means laterally movable through said opening for projection into the tube and for retraction into said compartment, means in the compartment disposed for relative coaxial movement therewith for actuating the article holding means, and guide means in the compartment for causing the movement of the article holding means.

16. A carrier for pneumatic systems including a tube having an element disposed along a wall of the tube and actuable to swing inward from said wall for engaging an article against release from the tube, and cam means for actuating said element, the latter and the cam means being arranged for relative angular movement about the axis of the tube, said cam means being located at one end of the element, and stop means at the other end of the element for limiting said relative movement.

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