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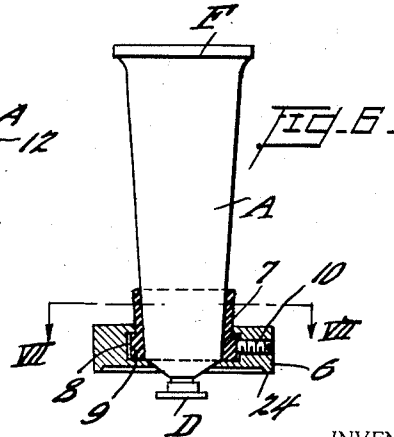
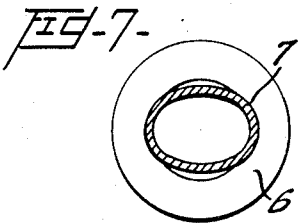
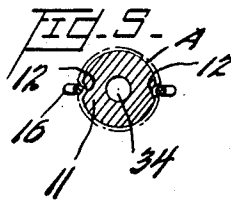
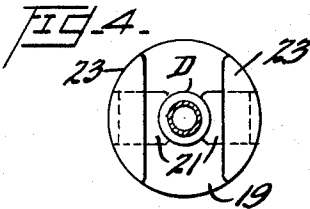
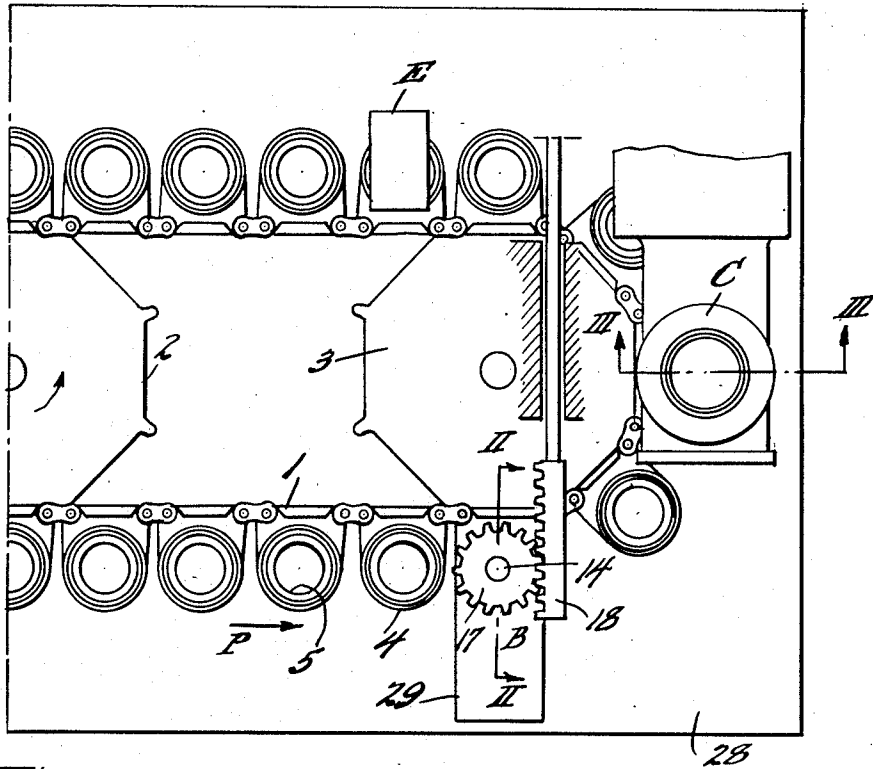
2,698,076

MEANS FOR CONVEYING CONTAINERS

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2 Sheets-Sheet 1

FIG. 1.



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2,698,076

MEANS FOR CONVEYING CONTAINERS

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2 Claims. (Cl. 198—131)

This invention relates to means for conveying containers for filling material, for example, collapsible tubes. My invention can be employed in connection with any means or method in current use for the treatment or filling of such containers, but it is especially designed for and is of particular importance in connection with means for flattening the open tube ends for subsequent closure.

In conventional machines for filling and closing collapsible tubes, said tubes are introduced into pockets in a turret or other conveyor to be fed successively into working positions for filling, closing, etc. If the machine is designed to handle tubes of various standard sizes, the conveyor or at least fundamental portions of same have been exchanged or rebuilt which involves loss of time and a material increase of the costs for machine equipment. While this inconvenience can be reduced by using replaceable metal holders for the tubes, such holders are not even able to adapt themselves to minor variations of the tube sizes. Furthermore, it might occur that such known tube holders will not even enclose successive tubes of the same standard size so tightly that they prevent the tubes from undesirable turning in the holders caused by vibrations in the machine, whereby it might happen that labels or prints on the tubes will occupy incorrect positions relative to means for collapsing and closing the tube ends. Also, the tubes being as a rule varnished may be damaged, especially when their upper ends are flattened for closing whereby the bottom portion of the tube mantle has a tendency to obtain an oval shape. While the tubes can be secured to the holders by springs or spring actuated locking members they are likely to be damaged by such means which will also increase the equipment costs and render the cleaning of the tube holders difficult.

It is an object of my invention to provide means which will serve to maintain the containers in a correct angular position during their transport without damaging the surface of the container walls, for example, collapsible tubes, even though they might be varnished, so as to locate the containers at work stations in an accurate angular position with respect to instrumentalities which are to operate upon them.

Another object of my invention consists in the provision of means which will serve to locate collapsible tubes and to maintain their positions as aforesaid without injury to the tube walls when becoming oval when their ends are flattened for subsequent sealing.

Still another object of my invention consists in the provision of simple, inexpensive, and readily replaceable means which will serve the aforesaid purposes.

Still another object of my invention consists in the provision of means of such character that the parts which must be interchanged when handling containers of different diameters are simple and inexpensive.

With these and other objects in view, the invention comprises certain novel features of construction, combinations and arrangements of parts, as will be hereinafter described and particularly set forth in the claims hereunto appended.

In the drawings:

Fig. 1 is a somewhat diagrammatic plan view of an embodiment of part of the machine according to the invention;

Figs. 2 and 3 are vertical sectional views, on an enlarged scale, taken on the lines II—II and III—III, respectively, of Fig. 1;

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Figs. 4 and 5 are cross sectional views taken on the lines IV—IV and V—V, respectively, of Fig. 2;

Fig. 6 is a vertical sectional view of a tube holder having a tube inserted into same, and

Fig. 7 is a cross sectional view of the tube holder taken on the line VII—VII of Fig. 6.

In the embodiment of the machine chosen for illustration, the containers, consisting of collapsible tubes A, are fed by a conveyor consisting of a chain 1 running over two sprocket wheels 2 and 3 to a station B for first screwing a cap tightly on to the tube, thence to a filling station C and thereafter to a station E at which the upper ends of the tubes are collapsed and coiled to be closed in known manner. The conveyor chain 1 has a plurality of interiorly slightly conical pockets 4 into which annular tube holders 5 are introduced to rest loosely but stably in said pockets. In the embodiment as illustrated each tube holder 5 consists of a relatively wide annular base member, for example, a collar 6 of metal, fibre or other suitable rigid material providing a broad stable area of support. A socket 7 of rubber is fixed in the collar 6, the socket being enlarged to form an annular flange 9 which is situated in an annular groove 8 in said collar. The socket 7 projects upwardly from the rigid base member or collar 6 a height of at least approximately half the diameter of the containers and out of conveyor pocket 4, and elastically encloses the container or tube A introduced into same so that the socket can adapt itself to minor variations of the size of the tubes and also to deformations of the tubes occurring when the tube ends F are flattened (Fig. 6), and to minor movements of the containers caused by the filling and closing operations without resulting in undesired distortions of the container walls. The interior cross section of the sockets 7 can be adjusted by means of a set screw 10 inserted into the collar 6.

When a holder 5 together with a tube A arranged in same has advanced to the cap tightening station B, a piston 19 elevates the holder 5 together with the tube and pushes the tube on to a spindle 11 the upper end of which has two longitudinal grooves 12 positioned diametrically opposite to each other. The spindle 11 has a shaft 14 rotatably journaled in a bearing 13 and provided with a pinion 17 which meshes with a toothed rack 18. A plate 15 rigid with the shaft 14 has two yielding downwardly extending fingers 16 the ends of which are positioned in the grooves 12 and are bent outwardly. When the tube A is fed on to the spindle 11, the upper end of its mantle is introduced between said spindle and the fingers 16 so that the tube material will be pressed into the grooves 12 whereby the tube is secured against rotation relative to the spindle 11. Thereafter the spindle 11 will be rotated by means of the rack 18 which may be driven in the manner described in United States patent to Johnson No. 2,104,485 dated January 4, 1938. During the rotary movement of the spindle 11 and the tube A, the tube cap D is retained by the piston 19. For that purpose the piston 19 has two pivoted jaws 21 actuated by a compression spring 22 to engage the tube cap D. The piston 19 is secured to a rod 20 which is moved up and down in the pocket 4, for example, by means as described in the aforesaid Patent No. 2,104,485. During its elevation out of the conveyor pocket 4 and its descent into said pocket the tube A rests firmly in the holder 5. The holder 5 will within an annular rim 24 on the collar 6 rest stably on shoulders 23 on the piston 19. When the piston 19 is moved downwardly it will, by means of the jaws 21, pull the tube A together with its holder 5 down from the spindle 11 until downwardly extending arms 25 of the jaws 21 abut the rim 26 of an opening 27 of a plate 29 secured to the machine frame 28. Thereby the arms 25 are, against the action of the spring 22, urged inwardly so that the jaws 21 will release the tube cap D whereby the holder 5 together with the tube A drop into the conveyor pocket 4. The spindle 11 and its shaft 14 have a bore 34 connected by a hose to a suction pump (not shown) to provide a suction channel for cleaning the empty tubes.

Thereafter the holder 5 together with the tube A sticking thereto are fed further to the filling station C at which is provided a piston 31 secured to a rod 30 which

may be driven up and down in the manner described in the aforesaid Patent No. 2,104,485. The piston 31 lifts the tube holder 5 resting stably thereon and pushes the tube A onto a filling spout 32 which has a central air blast pipe 35 adapted to clean the outlet opening of the spout 32. The pipe 35 is connected to a pressure pump (not shown).

From the filling station C the holder 5 together with the tube A are fed further to the station E for flattening and coiling the upper end of the tube in conventional manner. When the tube end is flattened it has a tendency to obtain an oval cross sectional shape. In the use of conventional metal holders for the tubes the holders cannot, of course, adapt themselves to such a deformation wherefore they are likely to damage the tube, and especially its coating of lacquer or the like. The elastic tube holder socket 7 will, however, as shown in Fig. 7 adapt itself to the change of cross sectional shape of the tube, so that it will always enclose the tube tightly before, during and after the deformation of the latter. Thus, the socket 7 will always enclose and retain the tube effectively, provided that its width corresponds to the standard size of the tube as handled at present. Other standard sizes however can be handled without using other sockets 7, viz. by adjusting the sockets by means of the set screws 10. If the variation of the standard size of the tube is too great to enable accommodation by means of the set screw 10 the inexpensive sockets 7 can be replaced by other sockets. Consequently, the machine can without any material increase of costs be used for handling tubes of different standard sizes and, if the difference is slight, the accommodation will not cause any additional costs whatever.

I claim:

1. Devices for holding containers on a conveyor in accurately determined positions for cooperation with apparatus for the performance of filling and closing operations, comprising a rigid holder base member having a tubular container-enclosing member a portion of which projects upwardly from the rigid base a height of at least approximately half the diameter of said containers to give guidance for accurate positioning of the containers, said projecting member being of readily flexible elastic material so as to accommodate containers which vary slightly in size or shape, and so as to allow movements of the containers caused during the said operations without causing undesired distortion of the container walls, the said rigid base member extending outwardly below the upwardly projecting portion of the tubular member providing a flange having a broad stable area of support for resting on said conveyor.

2. Devices for holding containers according to claim 1 and in which the base of the holding device is provided with screw means for engaging and altering the cross-section of said tubular member.

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