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R. K. POTTLE

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APPARATUS FOR SECURING A METALLIC ANNULUS

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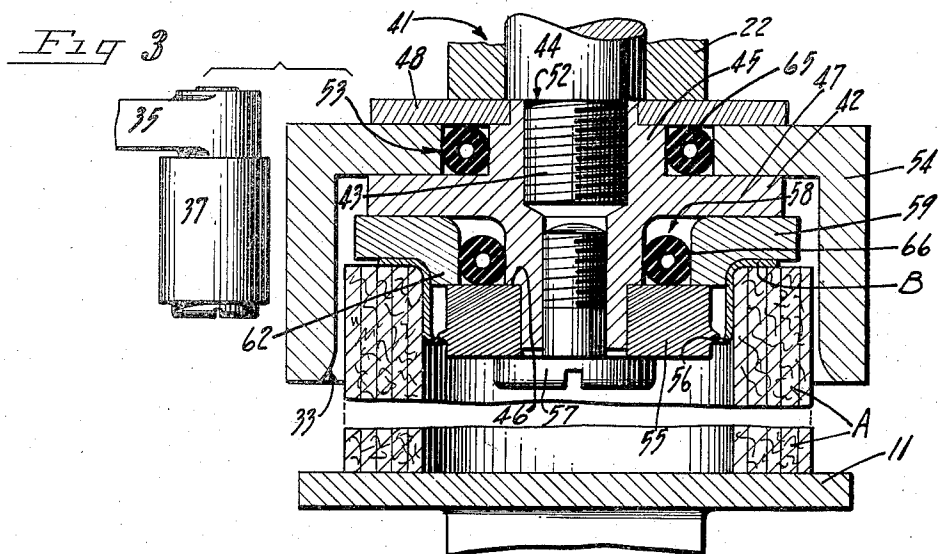


Fig 4

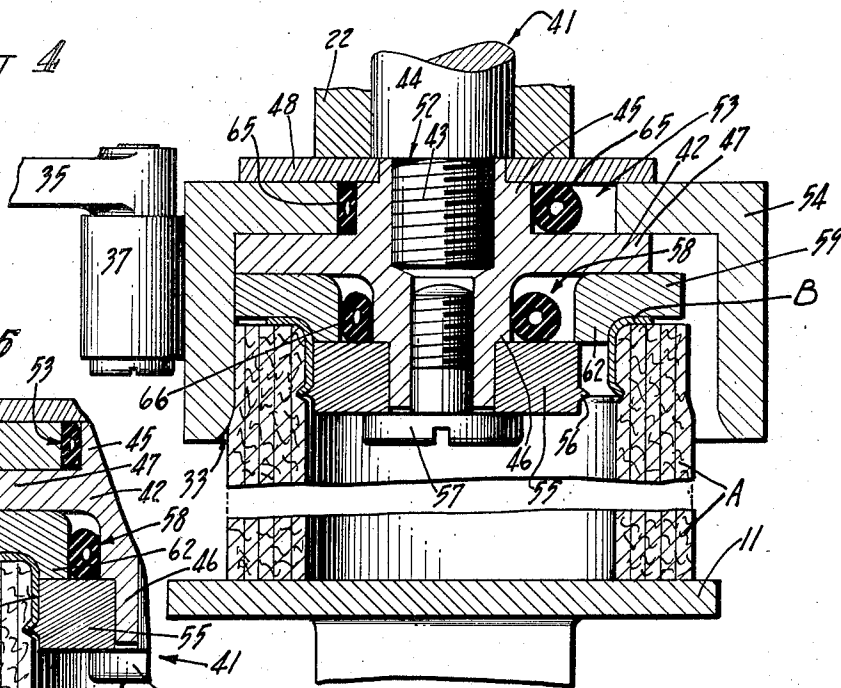
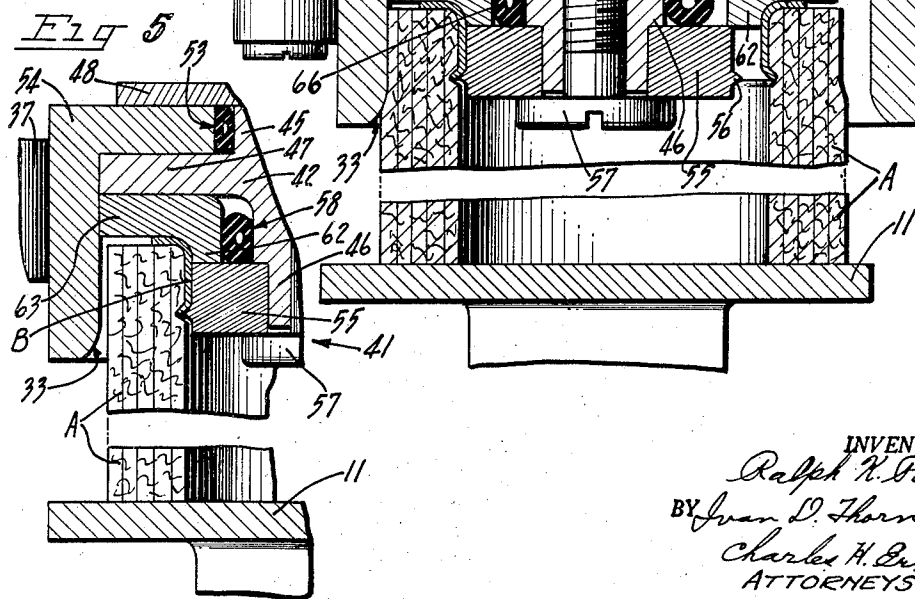


Fig 5



INVENTOR.
Ralph K. Pottle
 BY *Juan D. Thornburgh*
Charles H. Euse
 ATTORNEYS

UNITED STATES PATENT OFFICE

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APPARATUS FOR SECURING A METALLIC ANNULUS

Ralph K. Pottle, New York, N. Y., assignor to
American Can Company, New York, N. Y., a
corporation of New Jersey

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10 Claims. (Cl. 153-1)

1

This invention relates to the manufacture of fibrous tube members and has particular reference to an apparatus for securing a metallic reinforcing annulus in the open end of a cylindrical fibre tube by beading or crimping an inner edge of the annulus into the inside wall of the tube member in an improved manner.

In making fibre tubes a plurality of layers of paper or fibrous sheets usually are bonded together to produce a predetermined thickness of body stock. In many instances it is desirable that such body stock be made of inexpensive soft porous fibre or spongy pulp for reducing the material cost and for producing resilient tubes or container parts. The edges of such parts, however, do not withstand rough use or handling unless they are treated in a special manner or reinforced at the ends.

The present invention is directed to apparatus for securing a preformed reinforced metal annulus in an open end of a fibrous tube member to protect the inner peripheral edge. Such a metal annulus upon being inserted in the end of the fibre tube preferably is held in a predetermined assembled position and while so held is secured in place in the fibre wall by expanding parts of the annulus as by flaring, beading, or crimping a marginal edge thereof and embedding it into the tube wall.

An object, therefore, of the present invention is the provision of an apparatus that can be operated easily and quickly to align and hold an assembled fibrous tube member and metal annulus in a crimping head and to secure the annulus in the tube by reshaping and embedding a depending part of the annulus into the inner wall of the tube and in a predetermined position incident to protecting and reinforcing the adjacent edge of the tube.

Another object of the invention is the provision of an apparatus for producing such reinforced tube units wherein an assembled tube member and annulus, after being placed into a crimping head, are shifted laterally relative to a rotary inner chuck so that a reshaping element carried thereon is rolled in against the annulus to embed an edge thereof in the inner wall of the tube member.

A further object is the provision, in an apparatus of this character, of an outer floating ring for shifting and for pressing the tube with its metal annulus positioned in the end thereof, against a rotary inner chuck whereby the annulus is secured in position in the tube to reinforce the tube edge and at the same time the outer wall of

2

the tube adjacent the reenforced end may be reshaped or necked in.

Still another object is the provision in such an apparatus of inner and outer movable ring members which function for aligning and for shifting a metal annulus and a fibre tube with which it is assembled so that a part of the annulus is embedded within the wall of the tube by being brought into engagement with a reshaping element carried on an inner rotary chuck, such embedding action being performed without pressing against the outside of the tube wall so that porous fibrous stock may be used in the tube member.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

Figure 1 is a vertical section through a portion of a crimping head embodying the present invention, the view illustrating a fibre tube member and annulus assembly in position prior to securing the parts together;

Fig. 2 is a view similar to Fig. 1 with the parts in a different position, showing the annulus being secured into the fibre tube member as the latter is reshaped;

Fig. 3 is a vertical section through a portion of a modified form of crimping head, the view also illustrating a tube member and annulus in position for being united;

Fig. 4 is a view similar to Fig. 3 showing the apparatus parts in a different position for securing the annulus into the interior of the tube member and for reshaping the exterior of the tube; and

Fig. 5 is a fragmentary sectional detail of apparatus parts shown in Fig. 3, such parts being in a position after securing the annulus to the interior of the tube member and without applying pressure to the exterior of the tube, to prevent reshaping its outside surface.

In producing container parts with apparatus according to the instant invention, cylindrical fibre tubes A are provided and each is assembled with an annulus B in an end thereof. These parts are delivered individually onto a horizontal support 11 by hand or automatically as desired. Such tubes may be bodies or other parts of containers and may be fed from a stack or magazine in case of an automatic feed. Whether such feeding is done manually or by feeding devices the cylindrical tube is positioned upon the sup-

port so that it is concentric with a rotary crimping head 12.

The support 11 is movable vertically relative to the crimping head and this movement inserts the tube and annulus assembly into the head (Figs. 1 and 3). During such insertion the annulus headed end of the tube encircles a rotary inner chuck 13, (Fig. 1) which is located centrally in the crimping head and which rotates on the head axis. This insertion action fully seats the annulus or flanged collar B in a predetermined position in the end of the fibrous tube A.

The crimping head 12, carries an outer floating ring 14 which is concentric normally with the inner chuck 13 (Fig. 1) and which extends down and surrounds the latter, leaving the lower end of the ring open as an entrance or flared mouth for the insertion of the assembled tube and annulus. This outer floating ring is adapted to slide laterally relative to the axis of the head as it moves out of concentricity with the rotary chuck. Such a shifting action preferably is produced from an outside source, as by direct pressure applied against one side of the floating ring, through suitable means.

Such lateral shifting of the outer floating ring member 14 effects movement of the tube and its annulus causing the assembly to shift from its normal position of concentricity with the rotary inner chuck 13. In this shifting the tube may be pressed inwardly directly by the outer floating ring 14 (Fig. 2), or the tube may, through the shifting action of the ring, be drawn inwardly by internal engagement with the annulus B (Figs. 4 and 5).

The lateral shifting of the tube and annulus assembly together with movement of the outer floating ring 14, brings one side of the annulus B into peripheral engagement with the rotary inner chuck 13. Inner chuck 13 has a beading ridge 15 which is adapted to engage the lower marginal edge of the annulus B (Fig. 2) as the tube and annulus assembly moves inwardly. Such engagement sinks the annulus edge into the fibrous tube member A. As tube and annulus continue rotation in unison with the inner chuck 13, but at relative peripheral speeds, the beading ridge 15 engages and reshapes the entire peripheral edge of the annulus, thereby embedding the edge permanently into the tube member and securing the parts together.

While this action is taking place, the exterior wall surface of the tube member adjacent its annulus end may be necked in or reshaped if desired. For example, this would facilitate subsequent assembly of the annulus headed tube with other container parts, should such completed tube be used as a container body. Necking-in may be accomplished simultaneously with the securing of the annulus B into the tube A as shown in Figs. 2 and 4. The floating ring 14 is of the proper inside diameter to insure pressure against the outer wall of the tube member if such necking-in is desired, as will be obvious.

Release of pressure against the outside of the floating ring, following a tube and annulus securing and tube reshaping operation, allows the floating ring to return to its normal position concentric with the axis of the crimping head. The annulus headed tube then may be removed by lowering the support 11 and by withdrawing the completed tube from the head.

A preferred form of apparatus embodying the invention and for performing the various described operations is disclosed in Figs. 1 and 2 of

the drawings. The support 11 is carried by a suitable frame, which for the purpose of this invention need not be shown. Such a support is adapted to receive a tube member A and an annulus or flanged collar B to hold the same in assembled position and to bring the held parts into the desired predetermined position within the crimping head 12. The support is moved vertically relative to the crimping head and in timed relation with the movement of the crimping or beading mechanism.

The fibrous tube member A and its assembled metal annulus B are received on the support 11 concentrically with the crimping head 12, so that when lifted into the head both tube and annulus encircle the rotary inner chuck 13. In coming into the fully lifted position, the annulus B engages against an annular wall 16 formed on a flange 17 of the chuck. In this position the annulus B is seated fully in the end of the tube member and is so held during the crimping or beading operation.

Chuck 13 is secured to a threaded end 18 of a rotary spindle 19, journaled in a bearing 22 of the machine frame. A disk or thrust plate 23 is carried on the threaded end 18 of the spindle and is interposed in contiguous relationship between a shoulder 24 of the spindle 19 and a hub section 25 of the chuck. An annular space 26 surrounds the hub section and is interposed between the flange 17 of the chuck 13 and the disk 23. The outer floating ring 14 slides laterally within this space during a crimping operation as will be described more fully at this time.

Ring 14 comprises a disk section 27 and an annular skirt 28. The disk section has a central opening which is larger than the outside diameter of the chuck hub section 25. This in part provides for the space 26. A rubber or other resilient type of tube 32 is disposed within the annular space 26 and allows shifting of the outer floating ring 14 during a crimping operation and provides for return of the ring to normal position concentric with the rotary inner chuck after the crimping action has been completed.

The inside wall of the floating ring 14 adjacent the lower end is curved as at 33 to facilitate insertion and withdrawal of tube and annulus into and out of the crimping head. This curved section will also effect a more gradual blending or necking-in of the tube member where this is desired. The amount of necking-in or other reshaping depends of course upon the exterior dimension of the tube and the softness or sponginess of the material from which it is made as well as the shape and dimension of the inner wall of the ring.

A bracket arm 34 is extended from the frame or bearing 22 and carries a rocker lever 35. The lever 35 is pivotally mounted on a fixed pivot pin or stud 36 secured in the arm 34. One end of lever 35 may be connected to a suitable automatic operating means which in turn may provide for simultaneous rocking or swinging movement of the lever on its fixed pivot pin 36 in timed relation with the vertical movement of support 11, or the lever 35 may be hand operated if desired.

The opposite end of the lever 35 carries a roller 37 through the medium of a pin 38. This roller is adapted to press against the exterior wall of the outer floating ring 14 (Fig. 2) when the lever is swung on its pivot and to shift the ring laterally relative to the inner crimping chuck 13 during a crimping operation. When the roller 37 is

5

drawn back or swung away from the ring 14 following a crimping operation, the ring is returned to normal concentric position (Fig. 1) by action of the resilient rubber tube 32. This normally centered position provides clearance around the completed fibre tube unit which thereupon may be withdrawn from the crimping head with the lowering of the support 11.

As heretofore explained, porous fibrous stock is sometimes desirable for the manufacture of a tube, sleeve or the like. It often is necessary that such stock tube members be reenforced at an end with a metal annulus without compressing the fibrous stock. This means that the procedure just described of exerting pressure through the tube member to secure a metal annulus in an end must be modified as there will not be enough resistance in porous stock to give the required backing-up or force transmitting action. Only a slight change in the crimping head is required, however, to adapt the head for reenforcing of porous fibrous tubes and there is shown in Figs. 3 and 4 of the drawings a slightly modified form of rotary crimping head 41 for this purpose.

This modified form of crimping head 41 also has a rotary inner chuck part 42 which is mounted on a threaded end 43 of a rotary spindle 44. Both the upper and lower ends of this chuck part have stepped hubs as at 45 and 46 and an intermediate flange section 47. The upper stepped hub 45 is adapted to carry a disk or thrust plate 48, which like plate 23 engages against a shoulder (as at 52) on the spindle 44. Hence, an annular space 53 is provided between the thrust plate 48 and the upper surface of the flange 47. An outer floating ring 54 is carried in the head and has lateral movement in this space, and this ring corresponds to the former outer floating ring 14 as to construction but its action is slightly different.

The lower stepped hub 46 is adapted to carry a beading chuck roller 55 and this chuck roller is formed with a beading ridge 56, this being the equivalent of the beading ridge 15 formed on the chuck 13 in the head 12 previously described. Such a chuck roller may be secured against a shoulder formed on the hub and may be held fixed by a machine screw 57. In this embodiment therefore both of the parts 42 and 55 may be considered as the inner chuck for the crimping head.

The upper surface of chuck roller 55 is spaced from the under surface of the flange 47 to provide an annular recess 58. An inner aligning ring 59 is provided to extend into this space. This ring 59 is an additional element and is adapted particularly for porous stock tubes A as it relieves the necessity for application of beading pressure through the tube wall. Ring 59 therefore is free to shift from a normal concentric position on the inner chuck.

Inner aligning ring 59 has an annular depending wall section 62 (Figs. 3 and 4) which snugly engages the inner wall of a metal annulus when the latter is inserted into the crimping head 41 and is assembled loosely in the end of the fibre tube A. This positively seats the annulus B in the desired predetermined position in the tube and corresponds with the seating of the annulus and tube member in the crimping head 12, differing in that in the head 41 the wall section 62 also functions as a chuck and does not shift laterally of the annulus as in the instance of the chuck 13 of the head 12.

Fig. 3 shows the crimping head parts in a concentric normal position with an annulus and tube

6

member in place preceding a crimping operation. As the pressure roller 37 moves or is swung on its pivot against the outer floating ring 54, this ring starts moving toward the right as viewed in the illustration. Assuming that here again a necking-in of the tube end is desired, the upper end of the tube first will be engaged by the inner surface of the outer depending flange part of the ring 54 and as the tube and head rotate relatively to one another, the tube wall will be compressed to obtain the desired necking-in (Fig. 4).

Further lateral shifting of the floating ring 54 within annular space or recess 53 causes the inner surface of the flange or sleeve part of the ring to engage the outer periphery of the inner aligning ring 59 and as the tube and head continue rotating this ring 59 is shifted toward the right and within its recess 58. Both floating and aligning rings 54, 59, tube A and annulus B thus move out of concentric position relative to the axis 44 of the crimping head and the inner chuck.

This shifting action of the ring 59 with its closely fitting depending wall part 62 forces the annulus B laterally against the beading chuck roller 55 and as these parts all rotate relatively to the beading ridge 56 presses into the lower edge of the annulus B. This point of pressure is at the tangent point, toward the left side as shown in Fig. 4. Thus it will be evident since the annulus B is forced against the beading chuck roller ridge, that the beading action is not effected by pressure of the floating ring 54 applied through the porous fibre stock of the tube A.

When the inner aligning ring 59 is brought into this crimping position of Fig. 4, the outer floating ring 54 is moved against the outer periphery of the flange 47 of the chuck member 42. This engagement limits the amount of shifting action or lateral movement of the parts. After this position has been reached and while the beading continues, the flange 47 of the chuck part acts as a gauge to determine the depth of the bead being spun in the annulus. It will be observed that this is entirely independent of any beading pressure transmitted through the tube wall and this is an important feature peculiar to the modified head 41.

In the event that a necking-in of the tube A is not desired it will be obvious that merely increasing the outer diameter of the inner ring 59 will prevent the outer ring 54 from touching the tube wall. Figure 5 of the drawings shows the position of the parts where a modified inner ring 63 of larger diameter is substituted for the ring 59. This view shows the parts during the crimping operation and it will be observed that there is a clearance between the floating ring 54 and the tube wall.

In the second modified form of the invention as illustrated in Fig. 5 there is disclosed a head which will clinch the annulus B in place within the fibre tube A without necking in the exterior of the tube wall surface as in the instance of the preceding described embodiments of the invention. This is brought about by shifting the floating ring 54 against the aligning ring 63, which latter has a diameter slightly larger than that of the exterior wall surface of the tube so that the floating ring is never moved into contact with the tube. The aligning ring is formed with the concentric depending wall part 62 which fits down into the annulus and which serves to shift or pull the latter and the surrounding tube into engagement with the rotary chuck 55 when the diametrically opposite side of the aligning ring is

moved or pushed by the floating ring out of concentricity with the remaining parts of the head. With such modified form of clinching head pressure is never exerted against the outside of the tube and hence no necking in of the tube will occur. Under certain conditions it is desirable to leave the outside of the tube perfectly straight and smooth, and this result may be obtained by employing the modified structure of Fig. 5. In the preferred form of the invention as illustrated in Figs. 1 and 2, a pushing pressure is exerted against the outside of the tube to shift the annulus against the rotary chuck with the result that a certain amount of necking in of the tube occurs. There is no lateral or bodily movement of the chuck, and the beading and crimping operation in respect to the fibrous tube A and metal annulus B is otherwise performed in substantially the same manner in Fig. 5 as in the instance of the preceding described embodiments. Figs. 3 and 4 illustrate a modified form in which the amount of necking in of the tube may be controlled, while in the embodiment of Fig. 5 necking in of the tube is entirely prevented.

In either form of head as in Figs. 3 and 5 it will be seen that the nature of the tube wall, such as being stiff or porous, has no effect on the crimping action. As the roller 37 is moved back following a crimping operation, the rings 54 and 59 (or 63 when the modified head of Fig. 5 is used) are returned to normal positions concentric with the rotary inner chuck 42 (Fig. 3). Rubber tubes 55 and 56 may be provided for this purpose and may be located in the respective spaces 53 and 53. Since the rotation of the head tends by centrifugal force to bring the parts back into concentric position as the roller 37 recedes or is swung away from the outer floating ring 54, the rubber tubes may be entirely dispensed with in many instances.

The fibre tube member with its crimped-on reinforcing annulus now may be withdrawn from the crimping head as the support 11 is lowered. This frees the completed tube which may be pulled off of the wall section 62 of the inner ring 59. This may be done manually or in any suitable manner.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. In an apparatus for securing a metallic annulus having a depending flange upon the end of a fibre tube, the combination of a crimping head, a chuck located within said head and having a peripheral beading ridge, said chuck being rotatable on a fixed axis, a floating ring mounted on and surrounding said chuck in radially spaced relation thereto, said ring being adapted to encircle an assembled tube member and annulus inserted in the head with the said annulus surrounding the beading ridge on said chuck in radially spaced substantially concentric relation thereto, and means for laterally moving said floating ring said tube member into eccentric relation and clamping engagement with the said beading ridge of the rotating chuck to effect relative rotation of the said parts to embed the annulus flange into the interior wall of the tube

member to permanently secure the annulus thereon.

2. In an apparatus for securing a metallic annulus having a depending flange upon the end of a fibre tube, the combination of a crimping head, a rotary inner chuck rotatable on a fixed axis within said head and having a peripheral beading ridge, a floating ring mounted on and surrounding said chuck in radially spaced relation thereto, said ring being adapted to encircle in normal substantially concentric relation a loosely assembled tube member and annulus when the same are inserted as a unit within the head with the said depending annulus flange surrounding the beading ridge on the chuck in radially spaced relation thereto, and means for engaging and shifting said floating ring laterally into eccentric relation relative to the head and chuck to move the said tube member into clamping engagement with the said beading ridge of the rotating chuck to embed said annulus flange into the interior wall of said tube member, said floating ring by virtue of its said lateral movement engaging the outer wall of the tube adjacent the annulus to compress and neck in the outer tube surface during rotation of and relative to said rotating tube with said chuck.

3. In an apparatus for securing a metallic annulus having a depending flange upon the end of a fibre tube, the combination of a crimping head, a support vertically reciprocable therebeneath, a rotary chuck rotatable on a fixed axis within said head and having a peripheral beading ridge and a laterally extending flange section of less diameter than the outside diameter of the tube, an inner aligning ring member mounted for lateral sliding movement in said chuck and adapted to fully seat an assembled fibre tube member and a metallic annulus when they are positioned in end to end relation on said support and inserted in the head with the said annulus surrounding the beading ridge on said chuck in radially spaced normally concentric relation thereto, an outer floating ring member supported on said chuck in radially spaced normally concentric relation thereto and encircling said assembled parts, and means for moving said floating ring laterally inwardly into eccentric relation relative to said chuck, first to engage and reshape the outside of the tube and thereafter to engage against said inner aligning ring member to shift the same with the assembled tube member and annulus laterally inwardly against said chuck beading ridge until said floating ring member is held against further inward movement by engagement with the said laterally extending flange section of the chuck, whereby to effect coincident relative rotation of said chuck and ring member so that said beading ridge embeds the depending flange of said annulus a predetermined distance into the interior wall surface of the tube member distance to permanently secure the annulus in position on the tube and to reduce the outer diameter of the reshaped tube section to a predetermined extent.

4. In an apparatus for securing a metallic annulus having a depending flange thereon upon the end of a deformable porous fibre tube, the combination of a rotary crimping head, a chuck rotatable on a fixed axis within said head and having a peripheral beading ridge, means for inserting a loosely assembled tube and annulus into said head, an inner aligning ring member laterally slidable in said chuck and adapted to fully engage and seat a said porous tube member and a

said metallic annulus supported thereon when the same are inserted in the head with the depending flange of said annulus surrounding the beading ridge on said chuck in radially spaced normally concentric relation thereto, said chuck further having a laterally extending annular flange of a diameter greater than the outer diameter of said porous tube and disposed above the inserted end of the latter, an outer floating ring member seated on and surrounding said chuck in radially spaced normally concentric relation thereto and encircling said assembled parts, and means for engaging and moving said outer floating ring member laterally inwardly out of concentricity with said chuck to engage and shift said inner lining ring member inwardly to engage the depending annulus flange with the peripheral bead of the rotating chuck and also to engage said ring with the said laterally extending annular chuck flange to prevent further inward movement of the outer ring into contact with the exterior surface of the tube, whereby to effect relative coincident rotation of said chuck and annular flange to exert the entire beading pressure of the chuck against the inner surface of the tube member through the depending flange of its supported metallic annulus, whereby the lower portion of the annulus flange is embedded into the inner surface of the porous tube member to permanently secure the annulus in position on the tube in the absence of any ring pressure exerted against to the exterior tube surface.

5. In an apparatus for securing a metallic annulus having a depending flange upon the end of a fibre tube, the combination of a crimping head, a rotary chuck located within said head and rotatable on a fixed axis, a peripheral annulus beading ridge formed on said chuck, a floating ring carried by and surrounding said chuck and normally disposed substantially concentric with said chuck axis, said ring being adapted while so disposed to encircle a loosely assembled tube member and flanged annulus inserted in the head with the said annulus flange surrounding said annulus beading ridge on said chuck, and means movable into engagement with said floating ring to shift the same laterally out of concentric position and into engagement with said tube member to move the same and the annulus flange laterally into clamped engagement with said beading ridge, whereby to embed said annulus flange into the interior wall of said tube member to permanently secure the annulus thereon while said chuck and tube member are disposed in eccentric relatively rotating relation.

6. In an apparatus for securing a metallic annulus having a depending flange upon the end of a fibre tube, the combination of a crimping head, an inner chuck rotatable on a fixed axis within said head and having a peripheral beading ridge, a support movable vertically relative to said head and disposed in substantial axial alignment therewith for inserting one end of a said tube member having a said annulus loosely carried thereby into said head with the depending annulus flange surrounding said inner chuck beading ridge in radially spaced relation thereto, an outer floating ring carried by and surrounding said chuck in radially spaced relation thereto, said ring being adapted to encircle said assembled tube and annulus in substantially concentric relation when the latter are inserted in said head, and means for engaging and laterally shifting said floating ring relative to the head and chuck whereby said tube member with its assembled

annulus is engaged by said ring and moved laterally into eccentric relation and clamping engagement with said beading ridge of said chuck to effect relative and coincident rotation of said chuck and tube member to embed the said annulus flange into the interior wall of said tube member, thereby permanently securing the annulus in position thereon.

7. In an apparatus for securing a metallic annulus having a depending flange upon the end of a fibre tube, the combination of a clinching head, an inner chuck rotatable on a fixed axis within said head and having a peripheral beading ridge formed thereon, a support movable vertically relative to said head and disposed in alignment therewith for inserting one end of a said tube member and a said annulus loosely supported thereon into said head with the depending annulus flange surrounding said inner chuck beading ridge in radially spaced relation thereto, an outer floating ring mounted on and surrounding said chuck in radially spaced normally substantially concentric relation thereto, means for yieldably holding said ring in said normal concentric relation to said chuck to encircle in spaced relation a said loosely assembled tube and annulus when the same are inserted in said head, and means for engaging and shifting said floating ring laterally out of its concentric position relative to the head and into engagement with said holding means to engage said tube member and its assembled annulus with said beading ridge of said chuck to effect coincident relative rotation of said chuck and tube to embed the depending annulus flange into the interior wall of said tube member thereby permanently securing the annulus thereon.

8. In an apparatus for securing a metallic annulus having a depending flange upon the end of a fibre tube, the combination of a rotatable crimping head, a circular chuck rotatable on a fixed axis within said head and having a peripheral beading ridge, a support movable vertically toward and away from said head in axial alignment therewith for inserting one end of a said tube member and a said annulus loosely supported upon said tube end into said head, the inner diameters of the tube and annulus being greater than the external diameter of said beading ridge to permit said chuck to enter within the inserted tube and annulus in substantial concentric relation thereto, an outer floating ring mounted on and surrounding said chuck in radially spaced normally concentric relation thereto, said ring also surrounding in radially spaced relation the inserted and assembled tube and annulus, and means for moving said floating ring laterally out of concentric relation to said chuck to engage said tube member annulus flange against said beading ridge of said chuck at a point of tangency thereto to effect coincident relative rotation of said chuck and ring to embed the depending edge of the annulus flange into the interior wall of said tube during relative rotation of the tube, annulus and chuck, whereby to permanently secure the annulus in position on the inserted end of the tube.

9. In an apparatus for securing a metallic annulus having a depending flange upon the end of a fibre tube, the combination of a crimping head, a chuck rotatable on a fixed axis within said head and having a peripheral beading ridge thereon, means for inserting a loosely assembled tube and annulus within said head, an inner aligning ring member slidable laterally within

11

and relative to said chuck and adapted to engage and seat a said tube member and a said annulus in end to end relation when the latter are inserted into the head with the annulus surrounding the beading ridge on the chuck in radially spaced normally substantially concentric relation thereto, an outer floating ring member carried by said chuck encircling said assembled parts in substantially concentric radially spaced relation thereto, and means for engaging and moving said floating ring member laterally inwardly to engage against and shift said inner aligning ring member laterally to move said annulus flange into eccentric relation relative to and clamping engagement against the beading ridge of the chuck, whereby to effect simultaneous relative rotation of said chuck and tube to embed the depending flange of said annulus into crimping engagement with the interior wall of

12

the tube member to permanently secure the annulus in position on the end of the tube member.

10. In an apparatus for securing a metallic annulus having a depending flange upon the end of a fibre tube, the combination of a crimping head, a chuck located within said head and having a peripheral beading ridge thereon, said chuck being rotatable on a fixed axis, means disposed in radially spaced relation to the beading ridge of said chuck and an assembled tube and annulus inserted in the head, and means for laterally moving said radially spaced means and said tube and said annulus flange into eccentric relation and clamping engagement with said beading ridge of the rotating chuck to effect relative rotation of the said parts to embed the annulus flange into the interior wall of the tube to permanently secure the annulus thereon.

RALPH K. POTTLE.