Sept. 8, 1959 R. LOUIS 2,902,934

CASING AND METHOD OF MAKING SAME

Filed Jan. 17, 1955

Fig. 1

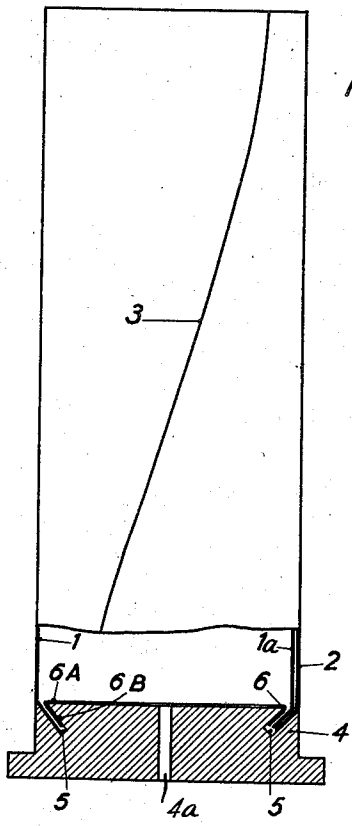


Fig. 3

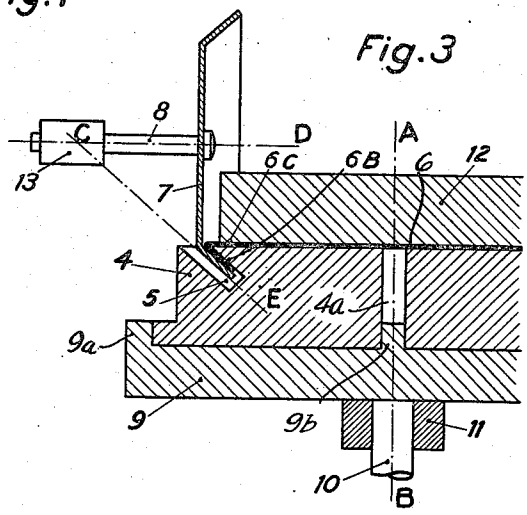


Fig. 2

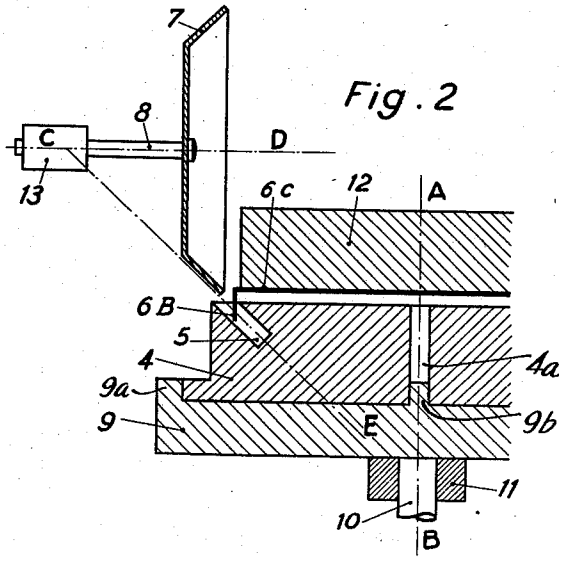
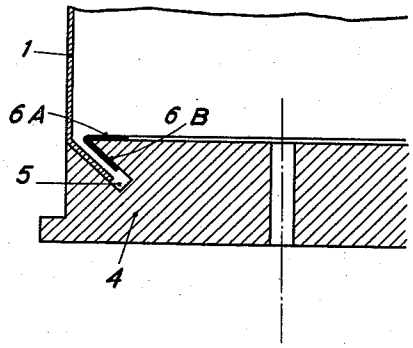


Fig. 4



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CASING AND METHOD OF MAKING SAME

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Claims priority, application France January 19, 1954

2 Claims. (Cl. 102—43)

This invention relates to cartridge cases and like containers comprising a tubular portion formed from a rolled metal sheet one end of which is crimped into a base provided with an inclined circular groove to receive the end of the tubular portion, and it is more particularly concerned with a method and means for joining the tubular portion of the base.

It is an object of the invention to provide a method and means of the character indicated which make possible considerable improvement in the quality of the connection of the tubular portion to the base and assure high uniformity in manufacture as well as excellent performance of the finished product in service, particularly in the case of high internal pressures.

It is a feature of the invention that a liner formed from a plastically workable material is inserted by means of movable rotative tools into the groove provided in the base of the casing and is pressed into engagement with the base and with the end of the tubular body portion in the final crimping operation.

Fig. 1 is a side elevational view, partly in section, of a cartridge shell constructed in accordance with the invention;

Fig. 2 is a sectional view showing the manner of inserting the lining member into the groove in the base in accordance with the invention;

Fig. 3 is a similar view of the same parts illustrated in Fig. 2 but showing the relationship of parts after the lining member has been crimped into place; and

Fig. 4 shows the relationship of parts after the insertion of the end of the tubular portion into the base groove.

The body of the cartridge casing 1 shown in Fig. 1 is formed from a metal sheet rolled into tubular form and comprising, for example, a single layer 1*a* and an overlapping layer 2, the overlapping edge of the sheet being shown at 3.

The tubular casing body 1 is secured by crimping to a base 4 which is circular in form and is provided with a circular groove 5 in which the lower edge of the body 1 is received. In forming the casing, groove 5 is compressed in a vertical direction by means of a suitable tool in order to clinch the edge of tubular body 1.

In accordance with one aspect of the invention, there is placed in the groove 5 along with the end of body 1 a liner 6 which is formed from a plastically workable or deformable material, such as lead for example, or from a non-metallic plastic material such as a thermoplastic natural or synthetic resin. Liner 6 advantageously has, in assembled position as shown, the form of a circular collar having a body portion 6A and a truncated conic portion or flange 6B rabbeted towards the longitudinal axis of body 1 and disposed against the inner face of the rolled sheet body end seated in groove 5.

The cartridge casing shown by way of example in Fig. 1 is constructed, in accordance with the method of the invention as follows:

Circular base 4 is placed in a support or anvil 9 which

has a peripheral flange 9*a* to confine the base 4 and a central projection 9*b* receivable in the axial passageway 4*a* in base 4. Support 9 is carried by a shaft 10 which is rotatable in a bearing 11 concentric with the axis A—B of base 4. There is then placed on the top surface of base 4 a liner blank 6C formed from lead or other plastically workable material as indicated above, blank 6C having a circular body portion and the cylindrical flange 6B. Blank 6C is pressed downwardly toward base 4 by a weight 12. A rotary tool 7 in the form of a dish is carried by a horizontal shaft 8 which is freely rotatable about an axis C—D in a bearing 13. The bearing 13 is movable obliquely downwardly along an axis C—E, which corresponds to the inclination of the groove 5. A corresponding movement is, of course, effected by the edge of dished tool 7.

When the tool 7 touches the flange 6B during its oblique movement toward axis A—B, the support 9 and the base 4 carried by it are slowly rotated. The tool 7 is driven by the resulting friction and it is gradually lowered along axis C—E until it penetrates into groove 5 as shown in Fig. 3.

After several complete turns of base 4 and support 9 during movement of tool 7 along axis C—E, the cylindrical flange 6B is inserted into groove 5 and bent towards the axis A—B as shown in Fig. 3, in which the tool 7 is seen in its final position, wherein the insertion movement is stopped by the body portion 6A reaching the upper surface of the base 4.

When this operation is completed, tool 7 is withdrawn and weight 12 is removed. The central portion of blank 6C is then removed by means of any convenient circular cutting tool (not shown) to define liner 6 with its relatively narrow body portion 6A. Into groove 5 is then inserted the lower edge of body portion 1, as shown in Fig. 4, and the parts are then crimped together by compressing the outer wall of groove 5, which gives the casing its finished form as shown in Fig. 1. Crimping is effected by any convenient tools known in the art.

The thickness of the liner 6 may vary but it is advantageously of the same order as that of the metal sheet forming tubular body 1. Generally speaking, the liner has a thickness of .2 to 1.5 mm. Flange 6B may extend only partly into groove 5 or it may extend entirely to the bottom of the groove. Advantageously, however, the flange 6B extends at least half-way into groove 5. The body portion 6A of liner 6 may vary in width but it is advantageously of a width just sufficient to hold the liner in place before the final crimping operation, as shown in the drawings.

During the crimping operation, the width of groove 5 is reduced and the flange 6B of the liner 6 and the lower end of tubular body 1 are compressed together in firm relationship.

It will be understood that various changes and modifications may be made without departing from the scope of the invention as defined in the appended claims and it is intended, therefore, that all matter contained in the foregoing description and in the drawing shall be interpreted as illustrative only and not in a limiting sense.

What I claim and desire to secure by Letters Patent is:

1. In the manufacture of shell casings and like containers wherein the end of a tubular body is inserted in a truncated conical groove in a base and is crimped to said base by compression in a vertical direction, the steps which comprise presenting to said base a cup-shaped deformable liner member having a flat body portion and a peripheral cylindrical flange directed toward said groove, rabetting progressively said flange towards the axis of the base which is slowly rotated so as to deform and to insert said flange into said groove, this insertion movement be-

ing limited by said body portion reaching the upper surface of said base, cutting out said central part of said liner body portion to leave an annular portion overlying said base, inserting one end of said tubular body in said base groove, and crimping said tubular body end and said flange in said groove.

2. In the manufacture of shell casings and like containers wherein the end of a tubular body is inserted in a truncated conical groove in a base and is crimped to said base, the steps which comprise presenting to said base a deformable liner member having a flat body portion and a peripheral cylindrical flange directed toward said groove, rabetting progressively said flange towards the axis of the base which is slowly rotated so as to deform and to insert said flange into said groove, this insertion movement being limited by said body portion reaching the upper surface of said base, cutting out said central part of said liner body portion to leave an annular portion overlying said base, inserting one end of said tubular body in said base groove, and crimping said tubular body end and said flange in said groove.

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