Sept. 20, 1938. H. REINARTZ 2,130,699

METHOD FOR THE PRODUCTION OF LIGHT METAL FLASKS WITH THICKENED NECK PARTS

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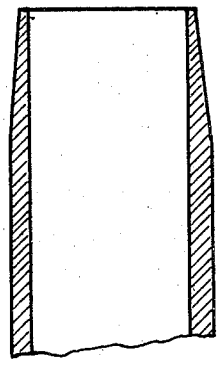


Fig. 1.

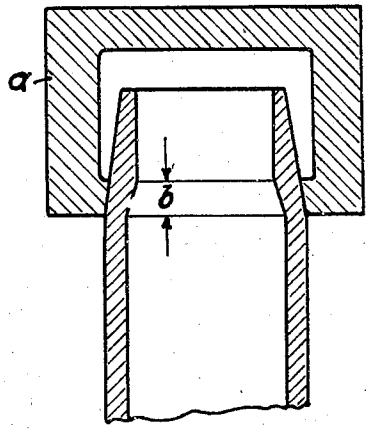


Fig. 2.

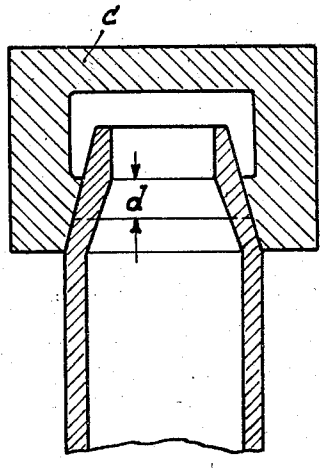


Fig. 3.

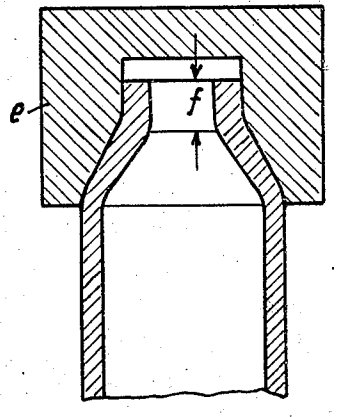


Fig. 4.

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METHOD FOR THE PRODUCTION OF LIGHT-METAL FLASKS WITH THICKENED NECK PARTS

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2 Claims. (Cl. 29—148.2)

This invention relates to a method for the production of flasks of light-metal for liquids and gases under high tension. The neck-portion of such flasks is weakened thereby that a screw-thread has to be cut in. To avoid this weakening it is advisable to make thicker than the other wall only the wall of the neck of the flask, in order to keep as light as possible the weight of such flasks and so that after the screw thread has been cut into the neck the thickness of the wall of the neck at least corresponds to the thickness of the remaining wall portions.

In order to make the neck of steel bottles thicker, it has already been proposed to press onto the open end of the preliminarily drawn cylindrical hollow body, in embracing the same by an insert-die, a press head in axial direction, by the shape of which the end of the hollow body is transformed into the shape of a bottle neck. During the reducing of the upper diameter of the hollow body an upsetting of the material in itself takes place and thereby an increase of the wall thickness.

Up to the present the hollow body of a steel bottle was continuously cylindrical prior to the re-shaping of the neck, or its upper part was thicker. Experiments have shown that, already with continuous cylindrical hollow bodies of light metal the radial resistance at the upper end of the bottle becomes so great that the hollow body especially within the insert-die yields in inward direction in undulated shape, whereas an appreciable thickening in the bottle neck does not occur at all. If the upper end of a bottle of light-metal would be thickened prior to the re-shaping, the radial pressing resistance would be considerably increased, so that also the wave-formation within the insert-die occurs in increased measure. Owing to the narrowing of the cross-section and accummulation of the material in the neck part a fold formation occurs further.

By experiments it has been ascertained that these inconveniences can be avoided in light metal flasks in a quite peculiar manner, if according to the invention the upper portion of the flask is made conically thinner prior to the re-shaping, and the drawing in of the bottle neck is carried out in several stages in such a manner that first the narrowing at the point of the thinning is completed which is farthest distant from the end of the hollow body, then in the middle and finally in the upper portion. The radial resistance of the wall surface against the narrowing is thereby gradually reduced from the point which has to be least narrowed up to the point which has to be narrowed most, and the axial pressure upon the wall not to be re-shaped is reduced also.

The new method is illustrated by way of example in the accompanying drawing, in which

Fig. 1 shows the hollow body with the upper end conically thinner at the outer side.

Fig. 2 shows the hollow body after the first narrowing,

Fig. 3 after the second narrowing and

Fig. 4 after the third narrowing.

It must evidently be left to those skilled in the art to select three or more narrowing stages according to the size of the flasks. For carrying out the new method as many differently shaped press-heads are required as narrowing stages exist. The first press head *a* engages only on the point of the conically thinned wall which has to be narrowed least, whereby at this point a thickening of the wall occurs approximately on the distance *b* of Fig. 2. The second press head *c* effects a thickening of the wall approximately on the distance *d* of Fig. 3. The third press head *e* gives to the bottle neck the final shape, the thickening taking place particularly on the distance *f* of Fig. 4. Prior to every narrowing the bottle neck is heated to about 400°. The new method can evidently be employed with all metals which relative to the narrowing behave in a similar manner as aluminium-alloy.

I claim:

1. A method for the production of light metal flasks with a thickened neck portion for liquids and gases under high tension from a preliminarily drawn cylindrical hollow body, consisting in first reducing the cross sectional area of the upper portion of the hollow body and conically forming the same prior to the reshaping, and axially and radially compressing the conical end of the hollow body and thereby reducing the same to neck formation in sequential steps in transverse zones toward the end of the neck and thereby moving the material of the conical end to produce a neck wall thickness greater than the thickness of the wall of the flask.

2. A method for producing a cylindrical metal container with a relatively thick walled neck and a thin side wall of substantially minimum thickness to withstand predetermined high pressure of liquids or gases consisting in first reducing the thickness of the neck end of the cylinder into end tapering conical formation and then axially and radially compressing the conical end into a smaller diameter by pressing at a transverse zone inwardly of the conical end to increase the wall thickness of the neck portion and successively pressing the conical end at transverse zones toward the outer end of the neck.

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