Jan. 3, 1967 E. GEDDE 3,295,485

END CLOSURE

Filed Dec. 30, 1963

Fig. 1

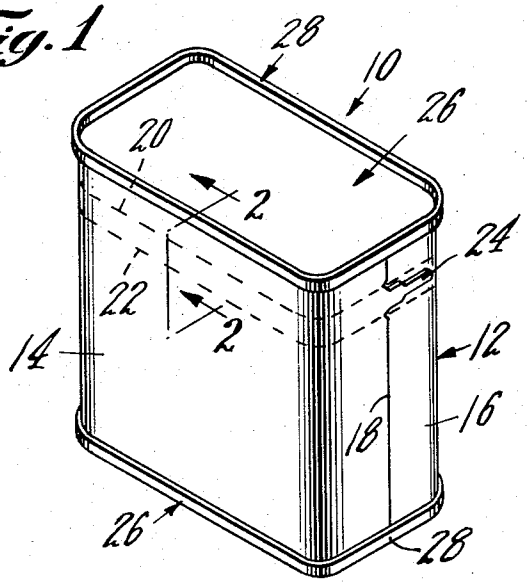


Fig. 4

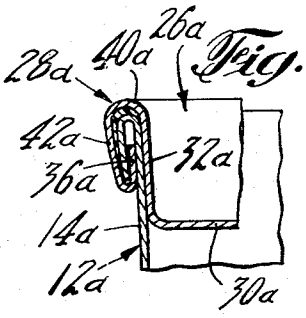


Fig. 2

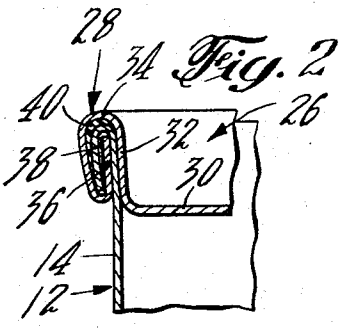


Fig. 5

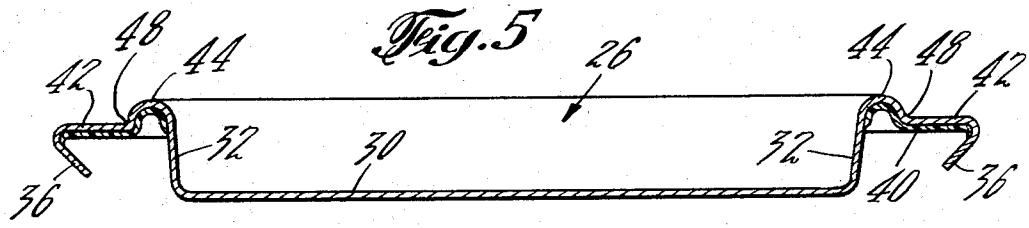


Fig. 3

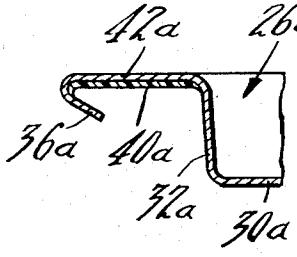


Fig. 6

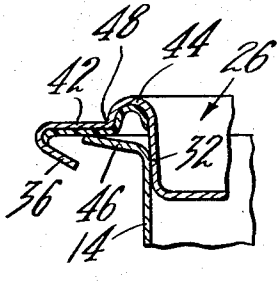
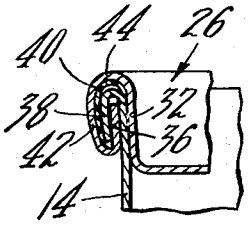


Fig. 7



INVENTOR.
ERIK GEDDE

BY Frank D. Presta

ATTORNEY

United States Patent Office

3,295,485
Patented Jan. 3, 1967

3,295,485

END CLOSURE

Erik Gedde, Park Ridge, Ill., assignor to American Can Company, New York, N.Y., a corporation of New Jersey

Filed Dec. 30, 1963, Ser. No. 334,113
1 Claim. (Cl. 113—121)

The present invention relates generally to a metal end closure for a can body and more particularly to a reinforced metal end closure for a can body having one or more relatively long, substantially straight sides.

In the seaming of metal end closures of the type having an outwardly extending flange and a countersink wall depending therefrom to can bodies having one or more relatively long, substantially straight sides, there exists a problem in that during the conventional double seaming operation there is a tendency for the countersink wall on the corresponding relatively long, substantially straight sides of the end closure to be considerably deeper than the countersink wall on the shorter sides or on the corners of the end closure. This elongation of the countersink wall is caused by a flowing or displacement of metal from the outwardly extending flange of the end closure into the countersink wall along the relatively long sides of the end closure, and results in a decrease in the length of the end closure double seam hook along these relatively long sides, with a consequent partially unhooked end seam in these areas which is more susceptible to leakage than a fully hooked end seam.

The present invention solves this problem by preventing the elongation of the countersink wall and the consequent reduction in the length of the double seam hook of the end closure during the double seaming operation. This is accomplished by providing a reinforcing bead on the inner portion of the outwardly extending flange adjacent the upper portion of the countersink wall of the end closure. This reinforcing bead provides a barrier to the flow of metal from the outwardly extending flange into the countersink wall during the double seaming operation, and thus results in a countersink wall of uniform depth throughout the double seam and prevents the reduction in length of the end closure double seam hook to insure a uniform, fully hooked end seam.

In effect, the provision of the reinforcing bead constitutes a preforming of this portion of the end closure into the shape which it should assume in the finished double seam, the bead being joined to the outwardly extending flange along a sharp radius of curvature which is spaced below the top edge of the end closure and provides a line of bend for the flange to thereby prevent substantial reshaping of the bead during the double seaming operation.

An object of the present invention, therefore, is the provision of a metal end closure for can bodies having one or more relatively long, substantially straight sides which is so constructed as to be uniformly double seamed to the can body.

Another object is the provision of such a metal end closure having an outwardly extending flange and a countersink wall depending therefrom which is so constructed as to prevent irregular elongation of the countersink wall during the double seaming of the end closure to the can body.

A further object of the present invention is to provide such a metal end closure wherein the outwardly extending flange thereof is reinforced adjacent the countersink wall

thereof to prevent the flowing of metal from the flange into the countersink wall along the relatively long sides of the end closure during the double seaming thereof to the can body.

Still another object is the provision of a method of double seaming an end closure to a can body having one or more relatively long, substantially straight sides which meets the other objectives of the invention.

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 drawing:

FIGURE 1 is a perspective view of a sealed metal container embodying the end closure of the instant invention;

FIGURE 2 is an enlarged sectional view taken substantially along line 2—2 in FIG. 1;

FIGURE 3 is an elevational view in section of a portion of a conventional end closure prior to the double seaming thereof to a can body;

FIGURE 4 is a view similar to FIG. 2 showing a completed double seam along one of the relatively long sides of a container when the conventional end closure of FIG. 3 is utilized;

FIGURE 5 is an elevational view in section of an improved end closure embodying the principles of the instant invention and shown prior to the double seaming thereof to a can body;

FIGURE 6 is an elevational view in section, with parts broken away, showing the improved end closure of FIG. 5 in position on a can body just prior to the double seaming operation; and

FIGURE 7 is an elevational view in section, with parts broken away, showing the relationship of the improved end closure of FIG. 5 and the can body after the first step in the double seaming operation is completed.

As a preferred and exemplary embodiment of the instant invention, FIGURES 1 and 2 illustrate a sealed metal can or container **10** of generally rectangular shape comprising a can body **12** having long sides **14** and short sides **16** and being provided with a conventional side seam **18** disposed in one of the short sides **16**. The can body **12** is provided with an easy opening feature in the form of a pair of score lines **20**, **22** which preferably extend completely around the periphery of the can body **12**. A tearing tongue **24** is formed integral with the removable area defined by the score lines **20**, **22** to facilitate the tearing of the removable area from the can body **12** and to provide for easy opening of the can **10**.

End closures **26** constructed according to the principles of the instant invention and having a shape substantially the same as that of the can body **12** are secured to the upper and lower ends thereof in conventional double seams **28**. Each of the seamed end closures **26** is identical in construction and comprises a depressed central panel **30** which merges with an upwardly extending countersink wall **32** that in turn merges at a curved upper portion **34** with a hook portion **36** (see FIG. 2). The can body **12** is provided with a hook portion **38** which interlocks with the end closure hook portion **36** in the conventional double seam **28**. A conventional sealing compound **40** is provided in the double seam **28** between the end closure **26** and the can body **12** to provide a hermetically sealed double seam **28**.

Referring now to FIGURE 3, there is shown a conventional end closure **26***a* in its form prior to being double

seamed to a can body. The end closure **26***a* comprises a recessed central panel **30***a* which merges at its outer end portion with a substantially vertical countersink wall **32***a* which in turn merges at its upper portion with an outwardly extending flange **42***a*. The outer portion of the flange **42***a* is provided with a hook portion **36***a* which forms a part of the double seam when the end closure **26***a* is seamed to a can body, and the undersurface of the flange **42***a* is coated with a conventional sealing compound **40***a*.

As shown in FIG. 4, when the conventional end closure **26***a* is double seamed in a conventional manner to a can body **12***a* of substantially the same construction as the can body **12** of FIG. 1, the countersink wall **32***a* of the end closure **26***a* is elongated throughout the portions thereof adjacent the relatively long, substantially straight sides **14***a* of the can body **12***a*. It has been discovered that this elongation of the countersink wall **32***a* results from a flowing or backing-up of metal from the outwardly extending flange **42***a* into the countersink wall **32***a* during the conventional double seaming operation under the influence of the inward pressure applied by the seaming rollers. This resultant elongation of the countersink wall **32***a* results in a reduced or shortened end closure hook **36***a* (see FIG. 4) and thus provides partially unhooked portions of the double seam **28***a* adjacent the relatively long sides **14***a* of the can body **12***a*. When the conventional end closure **26***a* of FIG. 3 is utilized with a can body **12***a* having relatively long, substantially straight sides **14***a*, therefore, the double seam **28***a* between the end closure **26***a* and the can body **12***a* is imperfect, owing to the partially unhooked portions thereof adjacent the relatively long sides **14***a* of the can body **12***a*, with the result that the double seam **28***a* is more susceptible to leakage than a fully hooked or uniform double seam.

The improved end closure **26** of the instant invention, as shown in FIG. 5, is constructed to prevent the flowing of metal into the countersink wall **32** thereof during the double seaming operation and thus is seamed to the container body **12** in a uniform, fully hooked double seam **28**, as shown in FIG. 2. The outwardly extending flange **42** of the end closure **26** is provided with a continuous, raised or upwardly extending reinforcing bead or rib **44** on the inner portion thereof adjacent the countersink wall **32**. The reinforcing bead **44** provides a barrier to the flow of metal from the outwardly extending flange **42** into the countersink wall **32** adjacent the relatively long sides **14** of the can body **12** when the flange **42** is forced downwardly and inwardly during the double seaming operation. The reinforcing bead **44**, therefore, prevents the elongation of the countersink wall **32** during the double seaming operation and thus prevents reduction in the length of the hook portion **36** of the end closure **26** to insure a fully hooked and uniform double seam **28**.

In the seaming of the improved end closure **26** to the can body **12**, the end closure **26** is first positioned on the can body **12** in the manner shown in FIG. 6, wherein the countersink wall **32** and the central panel **30** are disposed within the can body **12** and the outwardly extending flange **42** is supported by an outwardly flared portion or flange **46** on the upper portion of the can body **12**. The end closure flange **42** and the can body flange **46** are then interlocking forced downwardly and inwardly in a conventional two-step double seaming operation (not shown).

The relationship of the improved end closure **26** and the can body **12** after the first step of the double seaming operation is completed is shown in FIG. 7 wherein the end closure and can body are interlocked in a loose preliminary double seam. During the first step of the double seaming operation, there is substantially no elongation of the countersink wall **32** of the improved end closure **26**, since metal is prevented from flowing from the flange **42** into the countersink wall **32** by the reinforcing bead **44**. When the flange **42** is subjected to a downward and inward force during the double seaming operation, the bead **44** remains substantially intact to comprise the upper part of the double seam and the flange **42** is bent downwardly and inwardly along a substantially horizontal hinge line **48** which is disposed at the junction of the bead **44** and the flange **42**. Since there is no flowing of metal from the end flange **42** into the countersink wall **32** during the double seaming operation, there is no decrease in the length of the hook portion **36** on the improved end closure **26** as clearly seen in FIG. 7.

The resulting loose preliminary end seam of FIG. 7 between the improved end closure **26** and can body **12** then is tightened and formed into the finished, fully hooked and uniform double seam **28** of FIG. 2 during the second step of the conventional double seaming operation, wherein the bead **44** comprises the curved upper seam portion **34**.

It will be understood that during both the first and second double seaming operations, the body **12** and the end closure **26** are clamped together under considerable axial pressure by the lifter pad and the seaming chuck which comprise portions of the conventional double seaming mechanism. Thus, while, as shown in FIG. 6, the upper end of the body **12** is spaced a considerable distance below the compound **40** which is disposed in the bead **44**, the initial gap therebetween is gradually eliminated as the seaming operation proceeds, so that when the final seam has been completed, as seen in FIG. 2, the upper end of the body **12** is pushed into the bead **44** and into contact with the compound **40** located therein.

While the improved end closure **26** of the instant invention has been disclosed herein for use on a substantially rectangular can body **12**, it is noted that the instant end closure **26** may be used with a can body of any shape which comprises one or more sides of a length sufficient to result in a flowing of metal from the end closure flange into the countersink wall during a double seaming operation. Also, it is within the scope of the instant invention to provide a reinforcing bead in the end closure flange only in the portions thereof which are adjacent relatively long sides of the can body instead of utilizing the continuous bead **44** disclosed herein.

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:

A method of securing a metal end closure to a rectangular can body having a laterally outwardly extending flange at one end thereof, the end closure comprising a countersink wall and a flange extending generally laterally outwardly therefrom comprising the steps of:

forming a continuous raised bead in said end closure flange adjacent said countersink wall,

positioning said end closure on said one end of the can body with said countersink wall disposed within and in contact with the can body and said end closure flange disposed over and closely adjacent to the can body flange, and

forcing said said end closure flange downwardly and inwardly against said can body flange along a hinge line disposed at the junction of said end closure flange and said bead to form said end closure flange, said bead and said can body flange into a double seam between the end closure and the can body whereby the body flange is bent into a hook which has its bent portion nested within said raised bead in said end closure in close conforming relationship with the inner surface of said bead.

(References on following page)

References Cited by the Examiner

UNITED STATES PATENTS

1,412,175	4/1922	Gasset	220—49
1,689,641	10/1928	Pickles	113—120 X
2,250,002	2/1938	Bogner.	
2,277,066	3/1942	Bogner	220—49

2,455,737	12/1948	Coyle	113—120
2,460,296	2/1949	Kinney	113—120 X
2,558,723	7/1951	Ayres	220—67
2,739,732	3/1956	Bogner	220—49
3,139,211	6/1964	Bogner	220—48

THERON F. CONDON, *Primary Examiner.*