

(19)



Europäisches Patentamt

European Patent Office

Office européen des brevets

(11) Publication number:

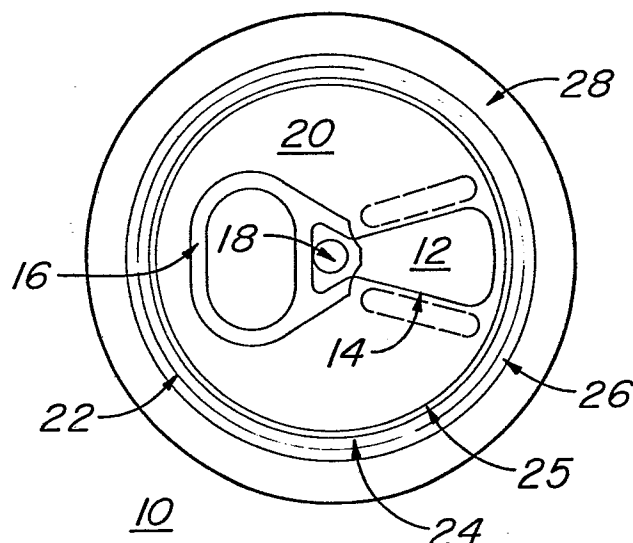
0 103 074
A3

(12)

EUROPEAN PATENT APPLICATION(21) Application number: **83105729.4**(51) Int. Cl.³: **B 21 D 51/26, B 21 D 51/44**(22) Date of filing: **10.06.83**(30) Priority: **09.09.82 US 416198**(71) Applicant: **BALL CORPORATION, 345 South High Street, Muncie Indiana 47302 (US)**(43) Date of publication of application: **21.03.84**
Bulletin 84/12(72) Inventor: **Nguyen, Tuan Anh, 1206 East 111th Place, Northglenn Colorado 80233 (US)**(84) Designated Contracting States: **AT BE CH DE FR GB IT LI LU NL SE**(88) Date of deferred publication of search report: **23.05.84 Bulletin 84/21**(74) Representative: **Kraus, Walter, Dr. et al, Patentanwälte Kraus & Weisert Irmgardstrasse 15, D-8000 München 71 (DE)**(54) **Increased strenght for metal closures through reversing curved segments.**

(57) The present invention relates to improvements in the strength of ends (10) used on metal beverage containers. Such ends generally comprise a center pane (20) of a substantially planar character, a surrounding annular grooved portion or countersink (21) made up of an inner panel wall (24), a chuckwall (26) and a first upwardly bowed arcuate segment (22) integrally joining the inner wall and the chuckwall, and a second downwardly bowed arcuate segment (25) integrally joining the inner wall and the center panel.

In accordance with the present invention the second arcuate segment is reversed by herein disclosed tooling to provide the closure with three reversing arcuate segments between the inner wall and the center panel and a reduced center panel diameter. The closure so formed exhibits an increase in buckle resistance between 8 and 10 percent which allows a thinner gauge material to be used in forming the closures. Other than the three reversing arcuate segments the closure formed in accordance with the present invention conforms very closely to standard dimensional characteristics allowing its use on existing customers' fill-and-seal equipment without modification. An additional advantage of the present invention is that it can be easily instituted on many of the existing closure production lines with minor modifications and extremely low additional press tonnage requirements.

**EP 0 103 074 A3**



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
D,A	US-A-3 441 170 (KHOURY)	1	B 21 D 51/26 B 21 D 51/44
D,A	--- US-A-3 774 801 (GEDDE)		
D,A	--- US-A-4 217 843 (KRASKA)		
A	--- US-A-4 093 102 (KRASKA) * Claim 1; figure 2 *		
A	--- GB-A-2 051 646 (CONTINENTAL GROUP) * Page 1, lines 119-121 *		
A	--- DE-A-2 532 194 (CONTINENTAL CAN) * Page 7, figure 2 *		
A	--- DE-A-2 820 514 (FEREMBAL) -----		TECHNICAL FIELDS SEARCHED (Int. Cl. ³) B 21 D 51/00 B 65 D 6/00 B 65 D 8/00
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 15-02-1984	Examiner SCHLAITZ J
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			