

Title (en)
BOTTLE STOPPER FOR FREEZE-DRYING

Publication
EP 0322548 B1 19930714 (DE)

Application
EP 88118843 A 19881111

Priority
DE 3744174 A 19871224

Abstract (en)
[origin: US4872572A] A lyophilization stopper made of a rubber elastic material is composed of a shank (1) and a circular disc shaped flange (2) made in one piece with the shank. The shank includes a cavity (4) which surrounds the longitudinal axis (A) of the shank and is open toward the free end face (3) of the shank, while extending toward a central closed wall portion (2b) of the flange. A first section (Z1) of the shank disposed between a first transverse plane (Q1) and a second transverse plane (Q2) has a closed outer circumferential face which has a maximum diameter (D). A subsequent second section (Z2) includes a passage which communicates with the cavity as well as a plurality of projecting blocking elements (14a-14c). The inner wall surface (19) which laterally delimits the cavity (4) and has an increasing diameter with increasing approach to the free shank end face lies completely outside a cone (K) whose axis is the longitudinal axis (A) of the shank, whose tip (K1) lies in the transverse plane (Q1) and whose tip angle (β), in degrees, is larger than a value calculated according to the formula $-39+75 \times \lg(D)$, where "D" is the maximum diameter (D) of the first section (Z1) measured in millimeters. In this way, a particularly utilitarian stopper is obtained which does not interfere with the insertion of the hollow extraction needle.

IPC 1-7
B01L 3/14; **B65D 39/00**; **B65D 51/24**

IPC 8 full level
B01L 3/14 (2006.01); **B65D 39/00** (2006.01); **B65D 51/00** (2006.01); **B65D 51/24** (2006.01)

CPC (source: EP US)
B01L 3/50825 (2013.01 - EP US); **B65D 39/0023** (2013.01 - EP US); **B65D 51/002** (2013.01 - EP US); **B65D 51/241** (2013.01 - EP US); **B65D 2539/005** (2013.01 - EP US)

Cited by
WO2008129409A1

Designated contracting state (EPC)
AT BE CH DE FR GB IT LI LU NL SE

DOCDB simple family (publication)
EP 0322548 A1 19890705; **EP 0322548 B1 19930714**; AT E91470 T1 19930715; DE 3744174 A1 19890706; DE 3882350 D1 19930819; US 4872572 A 19891010

DOCDB simple family (application)
EP 88118843 A 19881111; AT 88118843 T 19881111; DE 3744174 A 19871224; DE 3882350 T 19881111; US 28897288 A 19881223