

May 14, 1963

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3,089,603

VACUUM FLASKS

Filed Nov. 20, 1959

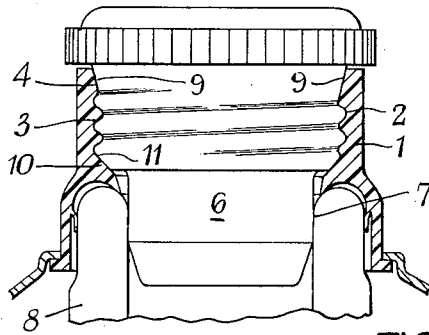


FIG. 1

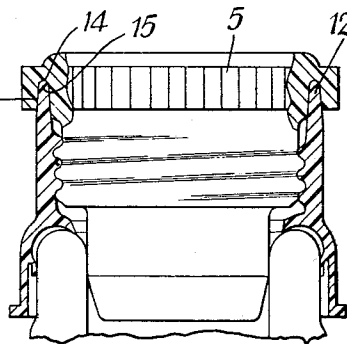


FIG. 2

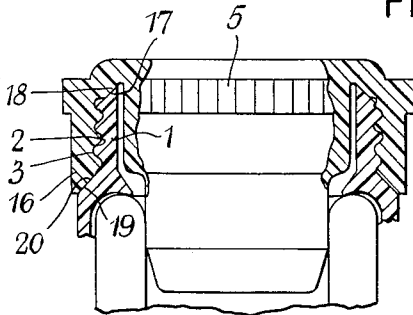


FIG. 3

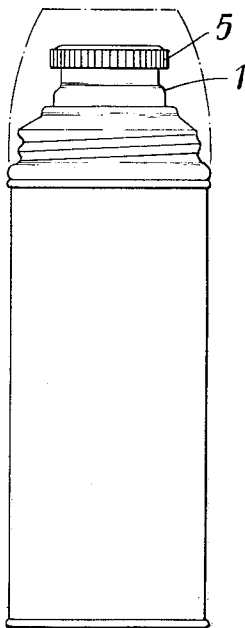


FIG. 5

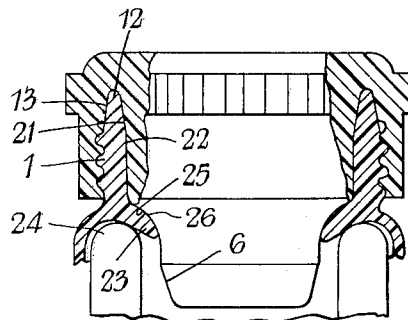


FIG. 4

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VACUUM FLASKS

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Filed Nov. 20, 1959, Ser. No. 854,408

3 Claims. (Cl. 215-13)

The present invention relates to vacuum flasks and more particularly to closures for vacuum flasks. In the complete specification of my co-pending patent application No. 706,321 there is described and claimed closure means for a vacuum flask in which a pouring member serves not only as the pouring member for the contents of the flask but also to locate the upper end of the vacuum bottle in the casing and in addition carries the threads for engaging a screw stopper the lower end of which is in a preferred form in the form of a bung which enters the neck of the bottle to seal the contents.

The pourer element and stopper or at least such portion of the pourer element as are serving to position the top end of the vacuum bottle in the casing are sufficiently flexible to allow the bottle to be located and to be aligned with the bung of the threaded stopper.

In such a construction it is convenient and desirable to provide a secondary seal against leakage of the contents of the bottle past the bung and according to the present invention there is provided upon the stopper and upon the pouring member at least one pair of cooperating faces which when the stopper is screwed home engage each other to form a seal. For the purpose of this invention the screw threading is not regarded as a sealing means but only securing means.

Preferably the faces are inclined to the longitudinal axis of the flask so that when the screw stopper is screwed home they engage each other in a wedge like action to form the seal. If the faces or one of the faces are or is formed from a resilient material the faces or face will be deformed against the other to provide a secure seal.

The pouring member is of course itself sealed against the vacuum bottle by suitable pressure faces for example as shown and described in the aforesaid specification.

Whilst in the construction shown in the aforesaid specification the pouring lip is shown as a second member from the shoulder of the flask it may if desired be formed in one piece with the shoulder.

It will be appreciated that the secondary seal may be in any one or more of the following positions:

- (a) Above the thread;
- (b) Below the thread;
- (c) Intermediate two threaded portions in which the diameter of one threaded portion is greater than the other;
- (d) Top edge of pouring lip;
- (e) On the surface of the pourer opposite to that on which the screw threads are formed.

The invention will now be described with reference to the accompanying drawings in which:

FIGURE 1 shows in section the upper end of a vacuum flask assembly embodying a construction in accordance with the present invention;

FIGURE 2 shows another construction in accordance with the present invention;

FIGURE 3 shows yet another construction in accordance with the present invention;

FIGURE 4 shows yet another construction in accordance with the present invention, and

FIGURE 5 shows in side elevation a vacuum flask assembly which may embody any one of the constructions of FIGURES 1 to 4.

Referring to the drawings, FIGURE 1 shows the posi-

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tions of the secondary seal. The pourer 1 is provided with internal screw threading 2 which engages screw threading 3 on the upper portion of a stopper 5 the lower end of which forms a bung 6 which enters the neck 7 of the vacuum bottle 8 when the stopper 5 is screwed home.

The pourer 1 is provided at its upper end with a tapering surface 4 against which a corresponding inclined face 9 on the stopper 5 engages when the thread is fully home.

In addition or instead of the engaging faces 4 and 9 there may be provided below the threading 2 on the pourer 1 an inclined face 10 which engages a matching inclined face 11 provided upon the stopper below the screw threading 3 and positioned above or at the upper end of the bung 6. When the pourer is made from a suitably resilient grade of polyethylene the faces 4 and 10 when engaged by their corresponding faces on the stopper 9 and 11 are slightly deformed to make a secure seal. Similar deformation of the surfaces may occur on the stopper but in one construction the stopper is internally reinforced so as to prevent deformation of its screw threading in which case the surfaces 9 and 11 are not substantially deformed when engaging with their opposite faces 4 and 10.

In the construction shown in FIGURE 2 the secondary seal is provided by forming the lip of the pourer 1 into an inverted V-section 12 which is engaged by an inverted V-sectioned groove 13 in the stopper 5. When either the stopper or the pourer are made of resilient material the V-sectioned groove 13 may be made with its walls at a slightly increased angle of inclination to the vertical so that when the stopper 5 is screwed home the inverted groove 13 tends to squeeze onto and to pinch the lip 12 of the pourer.

Alternatively the inverted V-section 12 of the pouring lip 1 may be made resilient and the flange of the stopper 5 containing the inverted V groove 13 may be made of substantially non-deformable material. In this case downward pressure of the base 14 of the groove 13 upon the tip 15 of the lip 12 serves to deform and spread the lip so that it is pressed firmly against the internal faces of the groove 13.

The construction shown in FIGURE 3 shows two methods of providing a secondary seal when the screw threading on the pourer is upon the outside although it will be appreciated that it is equally applicable when the screw threading is upon the inside. The screw threading 2 on the pourer 1 is formed on the upper portion of the pourer 1 and is adapted to be engaged by screw threading 3 upon the inside of a depending flange 16 upon the stopper 5. The lip of the pourer 1 is in this case provided with an inwardly inclined face 17 which is engaged by a correspondingly inclined face 18 on the area between the flange and the top of the stopper. Upon the stopper being screwed home a firm seal is provided and if the pourer is formed from a resilient material and the stopper is substantially non-deformable the mouth of the pourer 1 is slightly squeezed inwardly to provide an excellent seal.

In addition or as an alternative to the faces 17 and 18 there may be provided upon the outside face of the pourer 1 an inclined face 19 which is engaged by an inwardly inclined face 20 upon the lower edge of the flange 16 of the stopper 5. Here again if one or other of the faces is deformably supported and the other non-deformably the deformable face will submit to pressure to form a good liquid seal.

In FIGURE 4 the inside surface of the pourer 1 serves as a sealing face 21 and is appropriately inclined over all or portions of its length to mate with a correspondingly inclined face 22 on the stopper 5 above the bung

portion 6. In addition a similar formation to the lip of the pourer 12 may be provided which seals with the inverted groove 13 in the same manner as described with reference to FIGURE 2. In this particular case the skirt 23 of the pourer 1 which engages the lip 24 of the mouth 7 of the flask 8 serves on its inner face 25 as a sealing face to engage a correspondingly inclined face 26 on the stopper 5.

The mating surfaces when they are inclined need not be at the same angle of inclination and indeed when one or both surfaces are deformable it is advantageous to make one face of a slightly different angle or contour so that the deformable face may be deformed until it makes accurately with its mating face. Again whilst in the drawings all the mating faces are shown as being straight in section they may be of any desired contour, for example curved either as a simple or compound curve.

Whilst the invention has been described with particular reference to normal screw threading the term as applied to the present invention in this specification and claims includes any form of engaging surfaces which form whole or part of convolutions of a substantially helical nature.

What I claim is:

1. A vacuum flask assembly comprising a vacuum bottle, a casing housing the said bottle, a pouring lip member surrounding the mouth of the bottle and locating the bottle in the casing, an upstanding cylindrical portion on said pouring lip member extending upwardly from the mouth of the bottle, a screw thread on said cylindrical portion, a pouring lip defined by the open upper end of said cylindrical portion, a stopper, a depending bung portion on said stopper for sealingly engaging in the mouth of the bottle, a screw thread on said stopper engageable with the screw thread on the cylindrical portion of the pouring lip member for releasably securing the stopper with its bung portion engaged in the mouth of the bottle, and means separate from said screw threads providing a secondary seal for the contents of the bottle, the said secondary sealing means comprising a pair of inclined surfaces, each of substantial length on the cylindrical portion of the pouring lip member and inclined surfaces on the stopper which match the respective inclined surfaces on the cylindrical portion of the pouring lip member over substantially the full length thereof, and which wedgingly engage the respective inclined surfaces on said cylindrical portion when the stopper is screwed on to the pouring lip member to cause the secondary seal to have substantial width.

2. A vacuum flask assembly comprising a vacuum bottle, a casing housing the said bottle, a pouring lip member surrounding the mouth of the bottle and locating

the bottle in the casing, a stopper, a depending bung portion on said stopper for sealingly engaging in the mouth of the bottle, a screw thread on said stopper and a cooperating screw thread on the pouring lip member for releasably securing the stopper with its bung portion engaged in the mouth of the bottle, means separate from said screw threads providing a secondary seal for the contents of the bottle, the said secondary sealing means comprising a pair of inclined surfaces on the pouring lip member and matching inclined surfaces on the stopper which wedgingly engage the respective inclined faces on the pouring lip member when the stopper is screwed on to the pouring lip member, said surfaces being of substantial length and when engaged causing the secondary seal to have substantial width, and in which the said pair of inclined faces on the pouring lip member are located respectively immediately above and below the screw threading.

3. A vacuum flask assembly comprising a vacuum bottle, a casing housing the said bottle, a pouring lip member surrounding the mouth of the bottle and locating the bottle in the casing, a stopper, a depending bung portion on said stopper for sealingly engaging in the mouth of the bottle, a screw thread on said stopper and a cooperating screw thread on the pouring lip member for releasably securing the stopper with its bung portion engaged in the mouth of the bottle, means separate from said screw threads providing a secondary seal for the contents of the bottle, the said secondary sealing means comprising a pair of inclined surfaces on the pouring lip member and matching inclined surfaces on the stopper which wedgingly engage the respective inclined faces on the pouring lip member when the stopper is screwed on to the pouring lip member, said surfaces being of substantial length and when engaged causing the secondary seal to have substantial width, and in which the said pair of inclined faces on the pouring lip member are formed by the inner and outer surfaces respectively of an upwardly tapered inverted V section of the pouring lip member which engages in a correspondingly shaped groove in the stopper.

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