

May 9, 1939.

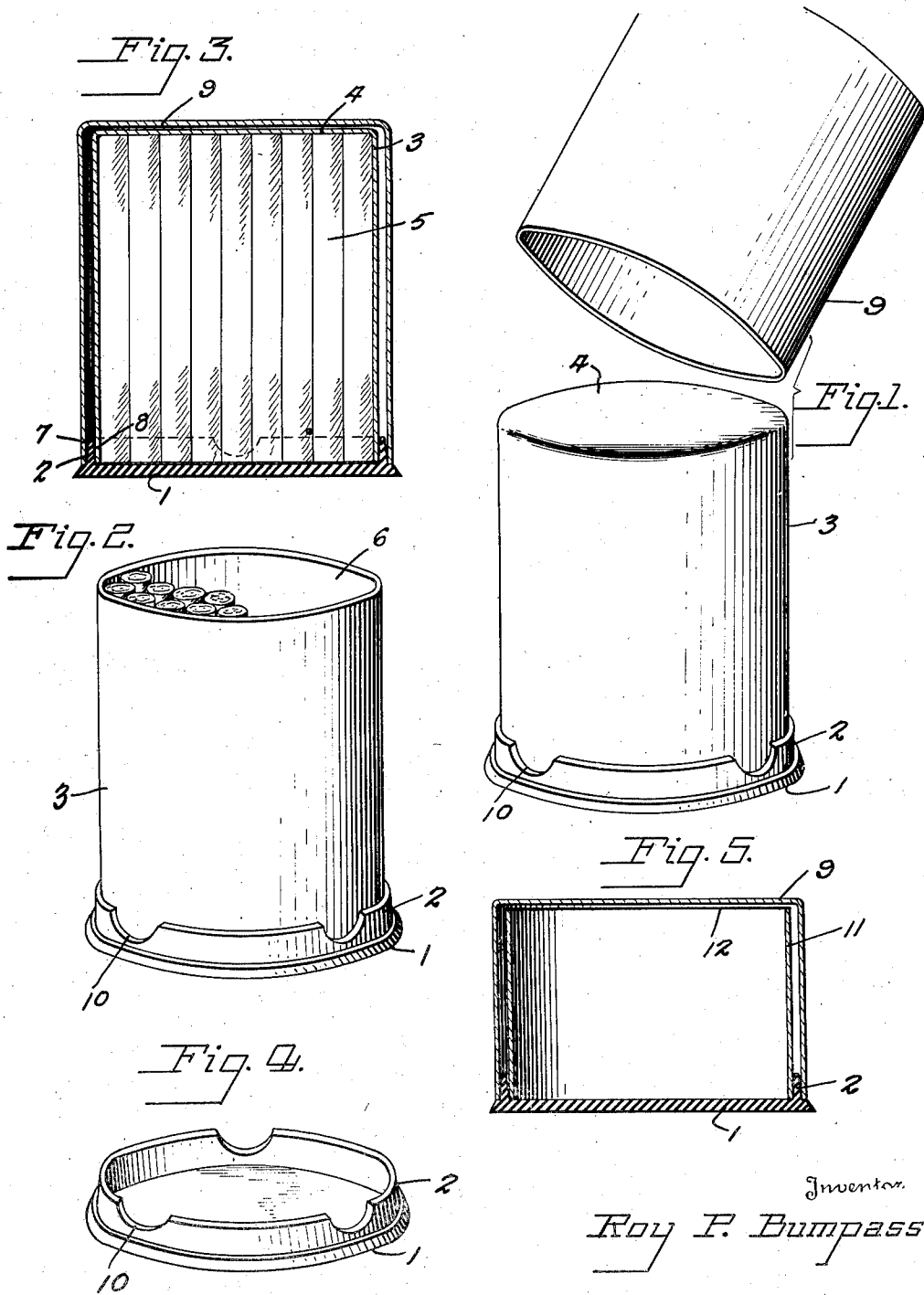
R. P. BUMPASS

2,157,255

FRICTION SEALING RECEPTACLE

Filed June 1, 1937

2 Sheets-Sheet 1



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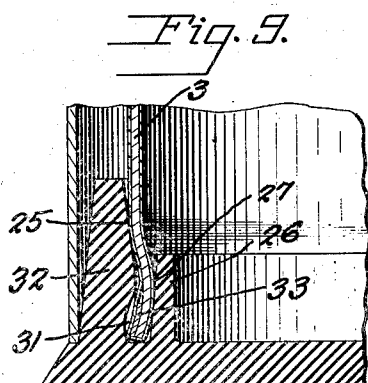
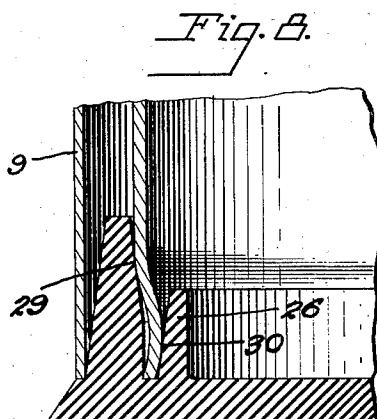
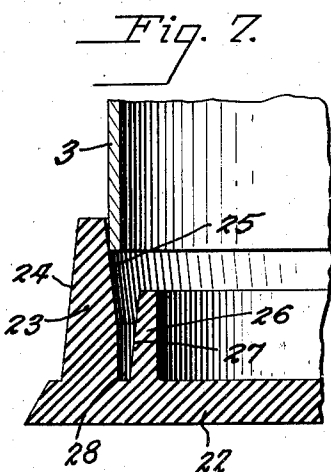
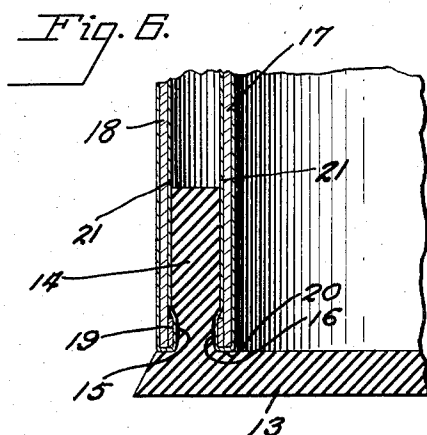
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FRICION SEALING RECEPTACLE

Filed June 1, 1937

2 Sheets-Sheet 2.



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2,157,255

FRICTION SEALING RECEPTACLE

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Application June 1, 1937, Serial No. 145,905

9 Claims. (Cl. 229—5.5)

This invention relates to friction-sealing boxes of that type in which a rigid bottom cooperates with a body or drum, which is the container proper, and an encompassing top in such manner as substantially to seal the contents of the box.

The invention appertains particularly to a box adapted to prevent the escape of the flavor or aroma of the contents, or in the case of pulverulent substance of impalpable fineness to prevent the contents sifting through to the outside of the box.

One of the objects of the invention is to provide a box of the type described including a rigid bottom member and less rigid body and top members, the latter having their open ends adjacent the bottom member in the closed position of the box, at least one of said top and body members cooperating with the bottom member so as to be conformed thereby to the shape of the bottom member so as to form a sealing seat with respect to the bottom member.

A further object of the invention is to provide a box of the type described in which the top and body members are of cylindrical contour especially adjacent their open ends and the body member is provided with a circumferential flange adapted to conform the open end portions of one or both the top and body members into sealing contact with said flange.

A more specific object of the invention is to make the flange tapered on either one or both sides and to have the body member cooperate with the inside, and the top member with the outside of said flange whereby the top member is spread or the bottom member contracted adjacent its open edge by the wedging action of said tapers thereby conforming the shape of one or the other of said top and bottom members to the shape of the co-acting surface of said flange to form a sealing contact between said members.

Still another object of the invention is to provide that the body member shall be frictionally held within the bottom member at either end so that it can be supported invertedly when desired.

Still another object of the invention is to provide the bottom member with a relatively rigid flange and either the top or body member or both with beads adapted to spring into channels at the base of said flange on either or both sides thereof as the case may be.

A further object of the invention is to provide the rigid bottom member with a pair of concentric flanges, said flanges at their point of juncture with the base of the bottom member being separated a distance not substantially greater than

the thickness of the body or drum member with which they cooperate, said flanges on their adjacent sides being relatively convergently tapered, the body member being of less rigid material than said flanges and being diverted by the taper of the outer flange into contact with the taper of the inner flange and by this latter taper again diverted toward the outer flange, in the act of pushing the edge of said body member between said flanges, whereby two sealing zones are produced and the sealing pressure at both zones accentuated by the reaction pressure produced by the respective tapers.

Another object of the invention is to provide a double sealed joint as described in which a reentrant channel is formed between said flanges and the edge of the body member adjacent its open end is provided with a bead which is forced into said channel through the diversion of the edge portion of the body member by the tapered flange which lies opposite said channel.

Other objects of the invention will appear as the following description of a preferred and practical embodiment of the invention proceeds.

In the drawings which accompany and form a part of the following specification and throughout the several figures of which the same characters of reference have been employed to designate identical parts:

Figure 1 is a perspective view of a box embodying the principles of the present invention showing the top lifted from the associated bottom and body structure;

Figure 2 is a perspective view of the body in inverted position with respect to the bottom;

Figure 3 is a vertical diametrical section through the box illustrated in Figures 1 and 2, the parts being in fully closed and sealed position;

Figure 4 is a perspective view of the bottom member;

Figure 5 is a vertical diametrical section through a slightly modified form of box embodying the principles of the invention; and

Figures 6, 7, 8 and 9 are fragmentary vertical sections in a diametrical plane illustrating modified forms of friction-sealing construction.

Referring now in detail to the several figures and first adverting to that form of the invention illustrated in Figures 1 to 4, inclusive, the box herein illustrated is adapted as a deluxe cigarette package. It comprises a bottom or base provided on its upper side with an annular flange. The bottom may be made of any suitable substance for example, metal or Bakelite and is characterized by substantial rigidity. The body

or drum 3 is cylindrical in form having the preferably integral and closed end 4. The body member, sometimes referred to as the drum is packed with cigarettes 5 as shown and the opposite or open end 6 is preferably covered with a taut membrane of "Cellophane" or the like. As shown, the flange 2 is formed both on its inner and outer sides with a slight taper or bevel, the inside and outside tapers being indicated respectively at 7 and 8, Figure 3.

The body member or drum is made of less rigid material than the bottom, for example, cardboard and is of such size that when inserted within the flange 2 it meets the inside taper at an intermediate point and from that point is crowded down within the flange, the taper conforming the edge portion of the body member to the shape of the inside of the flange so that it forms a true seal with said flange. The box is provided with a cover 9 adapted to encompass the body member and having its free edge portion meeting the outside taper 7 of the flange 2 at an intermediate point and beyond that point being crowded down upon said flange so that the edge portion of said cover member is expanded to conform precisely to the shape of the outer side of the flange. Thus, an inner and outer seal is formed between the bottom 1 and the body and cover members.

It is within the purview of the invention to have only one side of the flange 2 tapered and to rely upon a single seal. When the box is opened for use, it is preferred to invert the body or drum 3 inserting the closed end 4 within the flange of the bottom member 1. As it is assumed that the body 3 is of uniform diameter throughout, the closed end will crowd against the inside taper of the flange 2 at an intermediate point so that the body will stick frictionally within the base. The "Cellophane" covered end is then uppermost and the "Cellophane" may then be broken, giving access to the cigarettes. When the package has been depleted, the top and body members may be discarded and the bottom will then serve as an ash tray. For this purpose, it is provided with the cigarette-holding indents 10.

In Figure 5 which shows the same type of box adapted to contain face powder, the body 11 is open at the lower end and closed by "Cellophane" membrane 12 at the upper end. In filling, the body or drum 11 is inverted so that the open end is uppermost. It is filled with powder, then the inverted bottom 1 is forced down upon it, the tapered inner side of the flange 2 conforming the free edge of the body member to the shape of the flange and crowding it into close contact with the flange. The cover 9 is then slipped over the united body and bottom members until it meets the outside taper of the flange 2 at an intermediate point whereupon it is forced down upon said flange so that the lower edge portion of the cover 9 is expanded so as to conform to the exact shape of the outside of the flange and to form a sealing therewith.

Referring to Figure 6 in which the bottom 13 is made of molded Bakelite or other phenolic or similar condensation product, it has been found that the molding of the flange 14 may be so conducted that in the act of cooling shrinkage occurs at the base of said flange either on the inside or outside or both, forming under-cut circumferential channels 15 and 16.

Advantage may be taken of these channels for forming a sealing joint either on the inside or

outside or on both sides of said flange by providing either the body member 17 or the cover member 18 or both with a bead at the lower edge either inside or out according to the position of the associated channel 15 or 16, said bead being constituted for example by a narrow paper strip 19 or 20 pasted about the edge of the body or cover member and covered with the finishing layer of paper 21 as shown. The body member 17 is made of such diameter as to closely fit within the flange 14. The cover member 18 is likewise made so as to closely fit the outside of the flange 14 when either or both of these members is pushed into place, the bead carried thereby snaps into the adjacent channel at the base of the flange 14 and forms an effective seal.

It is a great problem in the manufacture of boxes to make one that will successfully prevent the sifting of impalpable face powders for example and Figures 7, 8 and 9 illustrate means for accomplishing this result. In Figure 7, the bottom 22 which is rigid and preferably of molded Bakelite has the outer flange 23 which may or may not have the external taper 24, but according to this embodiment of the invention it must have the internal taper 25. There is a concentric inner flange 26 having an external taper 27. These flanges are integrally molded as part of the bottom 22 and it will be observed that the internal taper of the outer flange stops at a point which is below the top of the inner flange and intermediate with respect to the height of the inner flange. Thus, there are two tapers 25 and 27 converging toward one another. The taper 25 is encountered first by the open edge of the body member 3 which causes the marginal portion of the body member 3 to be diverted inwardly as the body is pushed down so that it comes into contact with the taper 27 by which it is diverted in an opposite direction and finally comes to a rest at the bottom of the space 28 between the flanges. In this manner the marginal portion of the body member 3 is subjected to an S-shaped deformation, having a zone of contact indicated by the reference character 29 against the taper 25 and an opposite zone of contact 30 against the taper 27 and the reaction pressure created at each zone of contact enhances the pressure at the other zone. This forms an effective double seal. As shown, the cover 9 encounters an outside taper 24 on the flange 23 by which it is conformed to the shape of the flange 23, thus forming still a third sealing zone.

Figure 9 shows a form of the invention which is similar to that illustrated in Figures 7 and 8 excepting that the tendency of the Bakelite to contract and form a channel 31 at the base of the flange 32 has been taken advantage of by providing a bead 33 at the edge of the body member 3. This bead is constructed in a manner similar to the beads described in connection with Figure 6 and fits into the channel 31. In this form of the invention as the body member 3 is pushed down between the flanges 32 and 26 the marginal portion of the body adjacent the open end thereof is first diverted by the inner taper 25, then comes into contact with the outer taper 27 on the inner flange 26 being thus diverted in an opposite direction in which the bead 33 is forced into the channel 31.

While I have in the above description disclosed what I believe to be preferred and practical embodiments of the inventive concept, it will be understood to those skilled in the art that the

specific details are merely illustrative of other equivalent constructions which may be developed in the course of use and that the invention is to be determined not by the details as shown and described, but by a fair interpretation of the appended claims.

What I claim is:

1. Friction-sealing receptacle comprising a rigid bottom member, a body member and an open ended top member, said top member encompassing said body member with the edges of both members lying in operative relation to the bottom member, said top and body members having less rigidity than said bottom member, the latter having a flange of wedge-shaped cross section fitting the space between and slidably engaging the top and body members in the normal closed position of said receptacle, and distorting the edge portions of said top and body members to conform to the shape of and sealingly engage the sides of said flange.

2. Friction-sealing receptacle comprising a rigid bottom member, a body member and an open ended top member, said top and body members being of cylindrical form, said top member encompassing said body member with the edges of both members lying in operative relation to said bottom member, said top and body members having less rigidity than said bottom member, the latter having a cylindrical flange of wedge-shaped cross section fitting the space between said top and body members in the normal closed position of said receptacle, and distorting the edge portions of said top and body members to sealingly conform to the shape of said flange.

3. Friction-sealing receptacle comprising a rigid bottom member, a cylindrical body member having less rigidity than said bottom member, the latter having a cylindrical flange tapered on its inner side, within which flange said body member fits, the tapered side of said flange distorting the edge portion of said body member to sealingly conform to the shape of said flange.

4. Friction-sealing receptacle as claimed in claim 3, either end of said body member fitting frictionally within said flange.

5. Friction-sealing receptacle comprising a rigid bottom member, a body member and an open ended top member, said top member encompassing the body member with the edges of both members lying in operative relation to the bottom member, said top and body members having less rigidity than said bottom member, the

latter having a flange of wedge-shaped cross section with its outer surface tapered and forming a seat for the marginal edge of said top member whereby the edge portion of said top member is distorted to sealingly conform to the shape of the outside of said flange, either end of said body member fitting frictionally within said flange.

6. Friction-sealing receptacle comprising a rigid bottom member having concentric flanges, an open ended body member having less rigidity than said bottom member, said flanges being spaced apart a distance substantially equal to the free edge of said body member, the outer of said flanges having a taper on its inner side and the inner of said flanges having a taper on its outer side, the taper of said outer flange starting at a higher level than the inner taper whereby it is first engaged by the free edge of said body member when the latter is pressed between said flanges, the marginal portion of said body member being diverted zig-zagly by successively contact with said opposite tapers creating sealing zones in the regions of the respective tapers.

7. Friction-sealing receptacle as claimed in claim 6, the inner taper on said outside flange terminating at a point intermediate with respect to the outer taper on the inside flange.

8. Friction-sealing receptacle as claimed in claim 6, the inner taper of the outside flange terminating at a point intermediate with respect to the outer taper on the inside flange, the outer flange being provided with an annular recess on its side adjacent the base and said body member being provided with an external bead along its outer edge received in said recess in the final closed position of said receptacle.

9. Friction-sealing receptacle comprising a rigid bottom member, an open ended body member and an open ended top member, said top member encompassing said body member with the open end edges of both members lying in operative relation to the bottom member, said top and body members having less rigidity than said bottom member, the latter having an up-standing flange engaged between the walls of the top and body members, said flange being provided with an annular channel extending circumferentially with respect to its base, at least one of said top and bottom members adjacent its open ends having a bead adapted to snap into said channel in the fully closed position of said receptacle.

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