May 3, 1955 W. E. AMBERG 2,707,588

PAPER CLOSURE MEMBER AND PAPER CONTAINER

Filed July 19, 1951

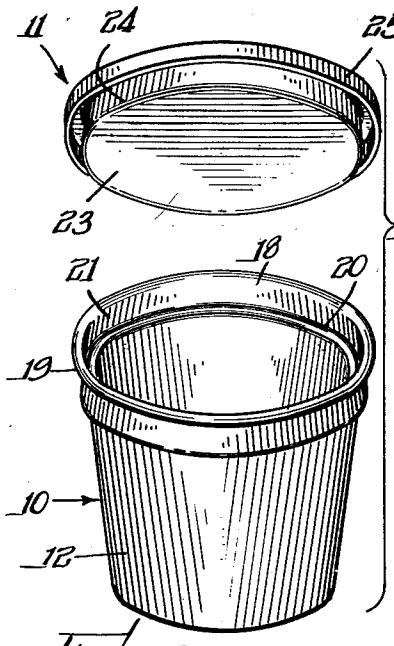


Fig. 1.

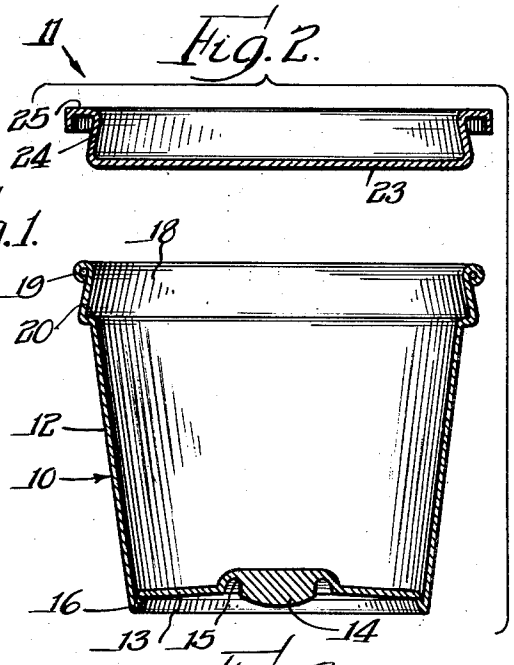


Fig. 2.

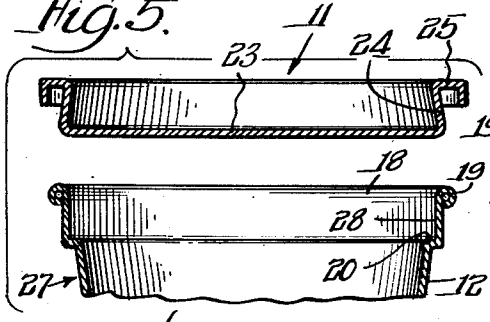


Fig. 5.

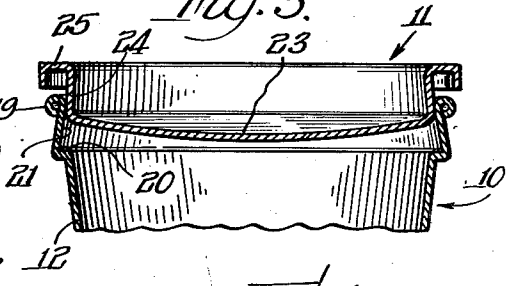


Fig. 3.

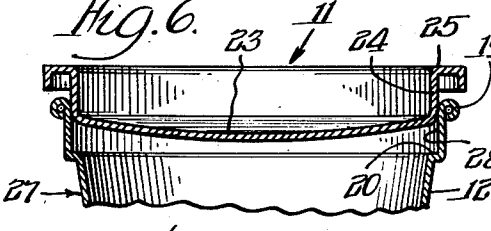


Fig. 6.

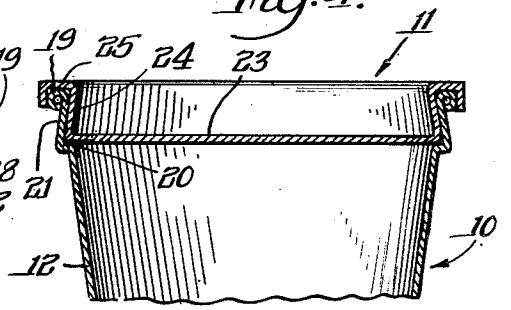


Fig. 4.

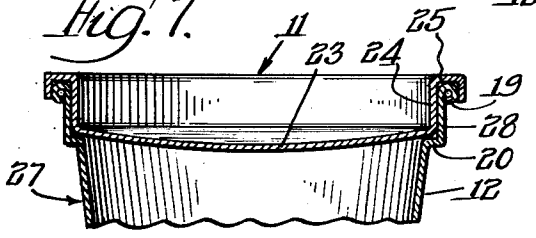


Fig. 7.

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United States Patent Office 2,707,588 Patented May 3, 1955

2,707,588

PAPER CLOSURE MEMBER AND PAPER CONTAINER

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Application July 19, 1951, Serial No. 237,549

1 Claim. (Cl. 229—43)

This invention relates to paper closure members for paper containers and the combination thereof.

In my copending application Serial No. 51,043, filed September 24, 1948, now Patent No. 2,568,697, granted September 25, 1951, there is disclosed an improved paper closure member for use with a paper container having an external rim at the open end thereof and an internal groove adjacent thereto. That paper closure member includes a closure wall portion and an integral side flange portion extending upwardly therefrom throughout the periphery thereof. The juncture of the closure wall portion and the side flange portion consists of a compressed solid peripheral bead in substantial planar alignment with the periphery of the closure wall portion and extending beyond the upwardly extending side flange portion to form a reinforced peripheral extension of the closure wall portion. The side flange portion lies adjacent the open end of the paper container and the compressed solid peripheral bead, forming an extension of the closure wall portion, snaps into the internal groove of the paper container and is held firmly therein positively to retain the paper closure member in the paper container. The side flange portion is also provided with an integral reentrant portion to overlie and receive the rim of the paper container to protect the same from dirt and contamination, to prevent plunging of the closure member into the container and to provide means for snapping the closure member from the container.

That paper closure member of the aforementioned patent application effectively seals the paper container against leakage and is firmly held in place in the paper container, it being snapped into and out of the internal groove adjacent the open end of the paper container. It is particularly useful with the larger sized containers such as cups, tubs and the like wherein the containers are relatively heavy and stable. However, it has been found that when such snap acting closure members are used with smaller sized containers, such as one or two ounce containers used as creamers and the like, there is a tendency to spill the contents of such small sized containers when the closure member is snapped therefrom, the snap acting removal of the closure member tending to impart a jerk or the like to the small sized container.

The principal objects of this invention are to provide an improved paper closure member particularly adaptable for use with smaller sized paper containers and to provide an improved paper container for use therewith, wherein the closure member effectively seals the open end of the paper container, wherein the paper closure member is readily applied to the paper container, wherein the paper closure member is firmly held in place in the paper container, wherein the paper closure member is readily removed without tendency to spill the contents of the paper container, wherein plunging of the paper closure member into the paper container is effectively prevented, and wherein contamination of the rim of the paper container is effectively prevented.

In carrying out these objects of the invention the paper container, having an open end to be closed by the paper closure member, is provided with an external rim about its open end, an internal shoulder adjacent its open end and a uniform internal surface between the internal shoulder and the open end. In accordance with one form of this invention, the internal dimension of the uniform internal surface is greater adjacent the internal shoulder than at the open end of the paper container to form a uniformly tapered inner surface. In accordance with another form of this invention the internal dimension of the uniform internal surface is substantially constant between the shoulder and the open end of the paper container to form a uniform straight inner surface.

The paper closure member for the open end of the aforementioned paper container, either form thereof, is a one piece paper closure member and includes a closure wall portion, and an integral side wall portion extending upwardly and uniformly inwardly from and throughout the periphery of the closure wall portion with the side flange portion and the closure wall portion forming an acute angle therebetween. In other words, the side flange portion has a uniform tapered outer surface. The paper closure member also has an integral reentrant portion extending outwardly from and throughout the periphery of the upper end of the side flange portion. The external dimension of the closure wall portion is greater than the internal dimension of the open end of the paper container and the external dimension of the upper end of the side flange portion is substantially the same as the internal dimension of the open end of the paper container.

When the paper closure member is being inserted in the open end of the paper container, the closure wall portion is flexed to decrease the external dimension of the closure wall portion so that it may be received through the open end of the paper container. When the paper closure member is so inserted, the closure wall portion engages the internal shoulder of the paper container, the side flange portion engages the uniform interior surface of the paper container between the shoulder and the open end thereof, and the reentrant portion receives the external rim of the paper container. When the paper closure member is removed from the paper container by grasping the reentrant portion thereof, the closure wall portion is also flexed to permit removal thereof.

In the first form of paper container of this invention, wherein the internal dimension of the uniform tapered internal surface is greater adjacent the internal shoulder than at the open end of the paper container, those internal dimensions are substantially the same as the external dimensions of the closure wall portion and the upper end of the uniform tapered side flange portion, respectively, of the paper closure member. Here, after the closure wall portion has been flexed to insert the paper closure member in the open end of the paper container, it unflexes as it engages the internal shoulder of the paper container to increase the outer dimension of the closure wall portion and correspondingly the side flange portion of the paper closure member. The uniform tapered side flange portion of the paper closure member firmly engages the uniform tapered inner surface of the paper container as the closure wall portion engages the internal shoulder of the paper container to form a tight joint therebetween, in the nature of a dovetail joint, firmly to hold the paper closure member in the open end of the paper container. When the paper closure member is removed from the paper container by grasping the reentrant portion thereof, the closure wall portion again flexes due to the camming action between the tapered inner surface of the paper container and the tapered side flange portion of the paper closure member to permit ready removal without any tendency to jerk the paper container with consequent spilling of the contents.

In the second form of the paper container of this invention, wherein the internal dimension of the uniform straight internal surface is substantially constant between the internal shoulder and the open end of the paper container, that internal dimension is substantially the same as the external dimension of the upper end of the side flange portion and less than the outer dimension of the closure wall portion of the paper closure member. Here, after the closure wall portion has been flexed to insert the paper closure member in the open end of the paper container, it remains flexed as it engages the internal shoulder of the paper container frictionally to engage the side flange portion of the paper closure member with the uniform straight internal surface of the paper container, the flexing of the closure wall portion assuring a firm frictional grip therebetween. In this way the paper closure member is firmly held in the open end of this paper container. When the paper closure member is removed from the paper container by grasping the reentrant portion thereof, the closure wall portion remains flexed also to permit ready removal without any tendency to jerk the paper container with consequent spilling of the contents.

In both forms of the paper container and in the single form of paper closure member of this invention the closure wall portion of the paper closure member engages the internal shoulder of the paper container and the uniform side flange portion of the paper closure member engages the uniform inner surface of the paper container to provide a tight seal between the paper closure member and the paper container and to maintain firmly the paper closure member in the open end of the paper container. The closure wall portion of the paper closure member also coacts with the internal shoulder of the paper container to prevent plunging of the paper closure member into the contents within the paper container. The reentrant portion of the paper closure member protects the external rim of the paper container from dirt and contamination, assists in preventing plunging of the paper closure member into the contents within the paper container, and forms means for removing the paper closure member from the paper container. Excellent results may also be obtained by utilizing substantially any degree of taper in the uniform internal surface of the paper container between the straight uniform internal surface (no taper) and a taper corresponding to the taper of the side flange portion of the paper closure member. Preferably, the taper of the uniform internal surface of the paper container should not exceed that of the side flange portion of the paper closure member.

Further objects of this invention reside in the details of construction of the paper container and of the paper closure member and in the cooperative relationships between the two.

Other objects and advantages of this invention will become apparent to those skilled in the art upon reference to the accompanying specification, claims and drawing, in which:

Fig. 1 is an exploded perspective view of one form of the paper container of this invention and a paper closure member of this invention for use therewith;

Fig. 2 is a vertical sectional view through the paper container and paper closure member of Fig. 1 and illustrating the paper closure member separate from the paper container;

Fig. 3 is a partial vertical sectional view similar to Fig. 2 but illustrating the paper closure member being inserted in the open end of the paper container;

Fig. 4 is a partial sectional view similar to Figs. 2 and 3 but illustrating the paper closure member received in the open end of the paper container; and

Figs. 5, 6 and 7 are partial sectional views similar to Figs. 2, 3 and 4, respectively, but illustrating a second form of the paper container of this invention.

Referring first to Figs. 1 to 4 of the drawing, one form of the paper container of this invention is generally designated at **10** and the paper closure member operating to seal the open end of the paper container is generally designated at **11**.

The paper container **10** may be any desired construction and have any desired shape, but for purposes of illustration herein it is shown to be like the paper container of copending application Serial No. 236,571, filed July 13, 1951 by Walter E. Amberg and Stephen W. Amberg. Here the paper container **10** is formed from a single piece of paper and includes a smooth side wall **12** which may be tapered for nesting purposes and a pleated transverse bottom wall **13** having a central solid paper button **14** at least partially received in a central recess **15**. The juncture of the pleated bottom wall **13** with the smooth side wall **12** may be provided with an annular rib **16** for supporting the paper container in an upright position.

The paper container **10** has an upper open end **18** and an external rim **19** is provided about the open end **18**. An internal shoulder **20** is formed in the side wall **12** of the paper container adjacent the open end **18** thereof. A uniform internal surface **21** is provided between the internal shoulder **20** and the open end **18** of the paper container **10**. In the form of the invention illustrated in Figs. 1 to 4 this uniform internal surface **21** is tapered inwardly from the shoulder, the internal dimension of the tapered uniform internal surface **21** being greater adjacent the internal shoulder **20** than at the open end **18** of the paper container.

The paper closure member **11** is a one piece paper closure member and it includes a closure wall portion **23** and an integral side wall portion **24** extending upwardly and uniformly inwardly from and throughout the periphery of the closure wall portion **23** with the side flange portion **24** and the closure wall portion **23** forming an acute angle therebetween. In other words, the side flange portion **24** has a uniform tapered outer surface. The paper closure member **10** also has an integral reentrant portion **25** extending outwardly from and throughout the periphery of the upper end of the side flange portion **24**. The external dimension of the closure wall portion **23** is greater than the internal dimension of the open end **18** of the paper container **10** and the external dimension of the upper end of the side flange portion **24** is substantially the same as the internal dimension of the open end **18** of the paper container. In other words, the taper of the side flange portion **24** and the external dimensions thereof are substantially the same as the taper of the uniformly tapered inner surface **21** and the internal dimensions thereof of the paper container **10**.

When the paper closure member **11** is being inserted in the open end **18** of the paper container **10** the closure wall portion **23** is flexed, as illustrated in Fig. 3, to decrease the external dimension thereof so that it may be received through the open end **18** of the paper container. After the closure wall portion has been so flexed to insert the paper closure member in the open end of the paper container, the closure wall portion **23** is brought into engagement with the internal shoulder **20** of the paper container and as this is done the closure wall portion **23** unflexes, as illustrated in Fig. 4, to increase the outer dimension thereof and correspondingly the outer dimension of the tapered side flange portion **24**. The uniform tapered side flange portion **24** of the paper closure member thereby firmly engages the uniform tapered inner surface **21** of the paper container as the closure wall portion **23** engages the internal shoulder **20** of the paper container to form a tight joint therebetween, in the nature of a dovetail joint, firmly to hold the paper closure member in the open end of the paper container.

To remove the paper closure member **11** from the paper container **10** the reentrant portion **25** of the paper closure member is grasped and pulled upwardly. When this is done the closure wall portion **23** again flexes due to the camming action between the tapered inner surface **21** of the paper container and the tapered side flange

portion 24 of the paper closure member to permit ready removal without any tendency to jerk the paper container and, hence, avoids spilling of the contents of the paper container.

A second form of paper container is generally designated at 27 in Figs. 5, 6 and 7. Here the paper container 27 may be like the paper container 10 of Figs. 1 to 4, with the exception that it is provided with a uniform straight internal surface 28 between the shoulder 20 and the open end 18 of the paper container instead of the uniform tapered internal surface 21. In other words, the uniform straight internal surface 28 has an internal dimension which is substantially constant between the internal shoulder 20 and the open end 18 of the paper container. The same paper closure member 11 is utilized with this form of the paper container. The internal dimension of the uniform straight internal surface 28 is substantially the same as the external dimension of the upper end of the side flange portion 24 and less than the external dimension of the closure wall portion 23 of the paper closure member 11.

When the paper closure member 11 is inserted into the open end 18 of the paper container 27, the closure wall portion 23 is flexed, as illustrated in Fig. 6, to permit the insertion. When the paper closure member 11 is fully inserted so that the closure wall portion 23 engages the internal shoulder 20 of the paper container 27, the closure wall portion 23 remains flexed as illustrated in Fig. 7. This causes the side flange portion 24 of the paper closure member 11 frictionally to engage the uniform straight internal surface 28 of the paper container, the flexing of the closure wall portion 23 assuring a firm frictional grip therebetween. In this way the paper closure member 11 is firmly held in the open end of the paper container 27. When the paper closure member 11 is removed from the paper container 27 by grasping the reentrant portion thereof and pulling upwardly thereon, the closure wall portion 23 remains flexed also to permit ready removal without any tendency to jerk the paper container with consequent spilling of its contents.

In both forms of the paper containers 10 and 27, and in the single form of paper closure member 11, the closure wall portion 23 of the paper closure member engages the internal shoulder 20 of the paper container and the uniform side flange portion 24 of the paper closure member engages the uniform inner surface 21 or 28 of the paper containers to provide a tight seal between the paper closure member 11 and the paper containers 10 and 27 and to maintain firmly the paper closure member 11 in the open end 18 of the paper containers. The closure wall portion 23 of the paper closure member 11 also coacts with the internal shoulder 20 of the paper containers to prevent plunging of the paper closure member into the contents within the paper containers. The reentrant portion 25 of the paper closure member 11 protetcs the external rim 19 of the paper containers from dirt and contamination, assists in preventing plunging of the paper closure into the contents within the paper containers and forms means for removing the paper closure member from the paper containers.

While the paper container 10 is shown to have an internal tapered surface 21, corresponding in degree and dimension to the tapered side flange portion 24 of the paper closure member 11, and while the paper container 27 is shown to have a substantially straight uniform internal surface 28, excellent results may also be obtained by utilizing substantially any degree of taper in the uniform internal surface of the paper container, which may vary between the straight uniform internal surface 28 of Figs. 5 to 7 and a taper corresponding to the taper of the side flange portion 24 of the paper closure member 11.

Preferably, the taper of the uniform internal surface of the paper container should not exceed that of the side flange portion of the paper closure member. The uniform internal surfaces between the internal shoulder and the open end of the paper container are angularly inverted from the body of the container. The external dimensions of the paper closure member 11 and the cooperating internal dimensions of the paper containers 10 and 27 are so selected as to maintain a tight fit between the paper closure members and the paper containers. However, due to the particular constructions of the paper closure members and paper containers, close tolerances in manufacture of the same are not necessary. The principles of this invention may also apply to containers and closure members made of materials other than paper, such as other resilient materials including plastics and the like.

While for purposes of illustration several forms of this invention have been disclosed, other forms thereof may become apparent to those skilled in the art upon reference to this disclosure and, therefore, this invention is to be limited only by the scope of the appended claim.

I claim as my invention:

In combination, a paper container having an open end, an external rim about its open end, an internal shoulder adjacent its open end and a uniform internal surface between the internal shoulder and the open end, and a one piece resilient paper closure member for the open end of the container including a closure wall portion, an integral side flange portion extending upwardly and uniformly inwardly from and throughout the periphery of the closure wall portion with the side flange portion and the closure wall portion forming an acute angle therebetween and an integral external reentrant portion extending outwardly from and throughout the periphery of the upper end of the side flange portion, the external dimension of the closure wall portion being greater than the internal dimension of the open end of the container and at least substantially as great as the internal dimension of said internal surface adjacent the internal shoulder and the external dimension of the upper end of the side flange portion being substantially the same as the internal dimension of the open end of the container, the closure wall portion being flexed as the closure member is inserted in the open end of the container and, when inserted, the closure wall portion engaging the internal shoulder of the container, the side flange portion frictionally engaging substantially the entire interior of the container between the shoulder and the open end thereof, and the reentrant portion receiving the external rim of the container.

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