DURABLE FREEZER TO CONVENTIONAL OVEN BAG WITH MATING SEAL

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ABSTRACT

A reclosable food storage bag able to withstand a wide temperature range manufactured from environmentally sensitive materials is disclosed. The bag can be manufactured from such materials as silicone rubber and thermoset resins. By using such materials, the bag can easily withstand the temperature ranges encountered in residential kitchens extending from the freezer to the oven and all ambient temperatures therebetween. In addition, by manufacturing the bag from such materials, the environmental impact of using petroleum based polymers is avoided.
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FIELD OF THE DISCLOSURE

[0001] The present disclosure generally relates to storage bags and containers and, more particularly, relates to durable food storage bags adapted to withstand a temperature range extending from below the freezing point of water to above the boiling point of water.

BACKGROUND OF THE DISCLOSURE

[0002] Food storage bags and containers are well known. Very common examples include bowls and casserole dishes into which the food can be loaded and closed using a secondary layer such as aluminum foil or plastic wrap. While effective, such an approach necessarily occupies the bowl for an extended period of time, and requires cleaning when done.

[0003] Over time, more disposable approaches have been developed including well known reusable and flexible food storage bags such as those marketed by the assignee under its trademark "ZIP-LOC®." With such an approach, a plastic bag typically made of polyethylene is formed from first and second sides which are hot welded across left, right, and bottom edges leaving an open top edge which can be opened and closed using a pair of interlocking grooves. Such grooves can be locked simply by pinching them together using the thumb and forefinger, or by sliding a mechanical wedge thereacross. While such bags have been met with extraordinary commercial success from their inception until the current day, the assignee has identified a current need in the marketplace for an improved food storage disposable bag which is able to better withstand the extreme temperature range experienced in everyday kitchen applications. Specifically, it would be desirable for such a bag to easily transition from the temperature experienced in a freezer to that experienced while cooking in an oven. As identified herein, that temperature range extends from below the freezing point of water to above the boiling point of water, and more specifically, from at least minus 20° F to at least plus 450° F.

[0004] An even more recent development in the marketplace has been the steadily escalating price of petroleum products from which many plastics and other polymers are derived. In addition, environmental interests have recently dictated that alternative materials be sourced for manufacturing such bags. Accordingly, a need exists for an improved food storage bag addressing such needs.

SUMMARY OF THE DISCLOSURE

[0005] In accordance with one aspect of the disclosure, a reusable food storage bag able to withstand temperatures from below the freezing point of water to above the boiling point of water is disclosed comprising a bottom wall, a side wall, and a closure mechanism. The side wall extends upwardly from the bottom wall and meets the side wall at a joint. An interior surface of the joint is arcuate. This side wall terminates at an end opposite the bottom wall at a top opening. The closure mechanism is mounted to the top opening.

[0006] In accordance with another aspect of the disclosure, a flexible and reusable food storage bag able to withstand a temperature range from below the freezing point of water to above the boiling point of water is disclosed and comprises a bottom wall, a side wall, and a closure mechanism. The side wall extends upwardly from the bottom wall and meets the side wall at a joint. An interior surface of the joint is arcuate. This side wall terminates at an end opposite the bottom wall at a top opening. The closure mechanism is mounted to the top opening.

[0007] In accordance with another aspect of the disclosure, a flexible and reusable food storage bag able to maintain structural integrity across a temperature range of at least as low as negative 20° F to at least as high as positive 450° F is disclosed. The food storage bag has interior surfaces with curve and tangent continuity of at least one-half inch.

[0008] These and other aspects and features of the disclosure will become more apparent upon reading the following detailed description when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] FIG. 1 is a perspective view of a food storage bag constructed in accordance with the teachings of the disclosure;

[0010] FIG. 2 is another perspective view of a bag constructed in accordance with the teachings of the disclosure, but depicted in an open configuration;

[0011] FIG. 3 is a front view of the bag of FIG. 1;

[0012] FIG. 4 is a top view of the bag of FIG. 1;

[0013] FIG. 5 is an enlarged sectional view of the closure mechanism of the bag of FIG. 4 taken along line 5-5;

[0014] FIG. 6 is a perspective view of the bag with reinforcement members shown in phantom;

[0015] FIGS. 7a-c are perspective views of an alternative embodiment of the disclosure with a sealing lid and;

[0016] FIGS. 8a-c are top views of the embodiments of FIGS. 7a-c;

[0017] FIGS. 9a-c are sectional views of the embodiments of FIGS. 8a-c, respectively; taken along line 9-9.

[0018] While the present disclosure is susceptible to various modifications and alternative constructions, certain illustrative embodiments thereof have been shown in the drawings and will be described below in detail. It should be understood, however, that there is no intention to limit the disclosure to the specific forms disclosed, but on the contrary, the intention is to cover all modifications, alternative constructions, and equivalents falling within the spirit and scope of the disclosure as defined by the appended claims.

DETAILED DESCRIPTION OF THE DISCLOSURE

[0019] Referring now to the drawings and with specific reference to FIG. 1, a reusable food storage bag constructed in accordance with the teachings of the disclosure is generally referred to by reference numeral 20. While the following detailed description and the accompanying drawings will be set forth in conjunction with a bag, it should be understood that the teachings of the disclosure are equally applicable to other forms of food storage containers in addition to bags and thus would include such shapes and items as bowls, casse-roles, pans, and the like.

[0020] As shown in combination with FIG. 2, FIG. 1 shows that the bag 20 includes a bottom wall 22 from which a side wall 24 upwardly extends. The side wall 24 can be formed from a single unitary piece of material or could be formed from first and second sides joined along lateral edges or seams.
26. In addition, the side wall 24 can be joined to the bottom wall 22 at a seam 28 or could be molded integrally therewith. Accordingly, it can be seen that the bag 20 includes a completely enclosed bottom and side forming an openable top 30.  

Fig. 1 shows the bag 20 in a closed configuration, while Fig. 2 shows the bag in an open configuration. In order to open and close the bag, a closure mechanism 32 may be provided. As shown in FIGS. 3 and 4, but particularly with respect to FIG. 5, the closure mechanism 32 may be provided in the form of interlocking members 34. As shown therein, side wall 24a includes a ridge 36 which is adapted to frictionally interfit with a groove 38 provided in side wall 24b. Accordingly, upon sufficient digital pressure being applied to the top edges 40 of the side wall 24, the ridge 36 and groove 38 interfit. Similarly, in order to open the bag, the user simply grasps the top edges 40 and applies sufficient outwardly directed force to pull the ridge 36 and groove 38 apart. As an added measure of closure, a mechanical compression member or elasp 42 may be provided. As shown herein, the mechanical elasp may include first and second legs 44 and 46 which can be pulled apart upon application of digital pressure to wings 48 and 50. A spring (not shown) may be provided to bias the legs 44 and 46 into a closed configuration.  

With specific reference to FIGS. 3 and 4, attention is drawn to the interior surfaces 52 of the bottom wall 22 and side walls 24. As shown, the bottom wall 22 meets the side wall 24 at the seam or bottom joint 28. As opposed to other forms of bags 20, the joint 28 is provided with a curved radius 52 so as to prevent the formation of any sharp corners or pockets into which food or other matter could be easily trapped. Such a shape facilitates removal of food from the bag with a spoon or the like, as well as washing the bag or otherwise cleaning the bag. Similarly, the side wall 24 is preferably manufactured from a single piece of material so as to prevent the formation of any sharp edges or corners therein as well. In order to further facilitate this, the bottom wall 22 is preferably manufactured from an oval or circular shape so that when the side wall 24 extends therefrom, no sharp edges or corners can be formed. Put another way, the bag 20 is formed with interior surfaces, all of which have curve and tangent continuity of sufficient radius for spooning and cleaning. The inventor has found that a sufficient radius is at least one-half inch.  

With respect to the material from which the bag is manufactured, it is intended for the bag 20 to be serviceable across the range of typical temperatures encountered in residential kitchens. For example, the bag 20 needs to be able to maintain its structural rigidity whether it is in a freezer, an oven, or any ambient temperature therebetween. Quantifying this temperature range, the bag 20 needs to be able to maintain its structural rigidity across a range of temperatures of at least below the freezing point of water and above the boiling point of water, and preferably from a range of at least minus 20°F to at least plus 450°F.  

In order to accommodate such a temperature range, the inventors have identified materials such as silicone rubber as a viable source for manufacturing the flexible bag. If needed in order to make the flexible bag of silicone rubber more rigid, thermoset resins may be used in conjunction with the silicone rubber. Suitable thermoset resins include, but are not limited to, melamine and phenol. Not only the bag, but the closure mechanism as well, could be manufactured from some combination of such materials.  

The bag 20 may also be provided with reinforcement members 56 to provide the bag with the ability to stay open to facilitate filling and the like. The reinforcement members 56 may be embedded directly in the side wall 24 or bottom wall 22 of the bag 20 as shown in FIG. 6. As opposed to specific reinforcement members 56, the physical properties of the silicone rubber or thermoset resins could be altered in desired locations so as to provide such areas of the bag 20 with greater stiffness than other areas. For example, portions of the side walls 24 could be made relatively stiff to hold the bag open with the top edges 40 being relatively soft and malleable to facilitate closure. Varying the durometer of the bag in such locations can be accomplished by appropriate molding, machining, or formulating as would be known by one of ordinary skill in the art.  

Referring now to FIGS. 7 and 8, an alternative embodiment of a bag 120 is depicted. The bag 120 has many of the same characteristics as the first embodiment in that it is able to withstand the temperature range identified above. The bag 120 may include a bottom wall 122 from which a side wall 124 upwardly extends. In addition, however, as opposed to interlocking members or a mechanical compression member to close the bag 120, a lid 158 is provided. The lid 158 may include a circumferential rim 160 adapted to sealingly mate with an upper lip 162 of the bag wall 124. Moreover, to stiffen the bag and allow the bag 120 to more easily stand for filling and the like, the side wall 124 may be folded over as shown in a comparison between FIGS. 9a and 9b. In so doing, the upper lip 162 is formed. As shown in a comparison between FIGS. 9 and 9c, the sidewall 124 can be folded over at a plurality of positions resulting in a plurality of heights, a plurality of storage volumes and a plurality of wall stiffness/reinforcement levels. The lid 158 may include a handle 164. The bag 120 is depicted with an oval configuration in lateral cross-section, but it is to be understood that other forms including circular or cylindrical shapes are possible.  

From the foregoing, it can be seen that the teachings of the disclosure can be used to manufacture a usable, reclosable, and flexible food storage bag which is able to withstand a wide temperature range while at the same time being manufactured from materials which are more environmentally sound than polymer materials currently on the market.  

What is claimed is:  
1. A reclosable food storage bag able to withstand a temperature range from below the freezing point of water to above the boiling point of water, the food storage bag comprising:  
   a bottom wall;  
   a side wall extending upwardly from the bottom wall, the bottom wall meeting the side wall at a joint, an interior surface of the joint being arcuate, the side wall terminating at an end opposite to the bottom wall at a top opening; and  
   a closure mechanism mounted to the top opening, the bottom wall, side wall, and closure mechanism all being manufactured from silicone rubber.  
2. The reclosable bag of claim 1, further including reinforcement members embedded in the side wall to facilitate holding the bag open during filling.  
3. The reclosable bag of claim 1, wherein the silicone rubber has a varying level of stiffness in the bottom wall and the side wall.  
4. The reclosable bag of claim 1, wherein the closure mechanism includes interlocking grooves.
5. The reclosable bag of claim 4, further including a mechanical compression member adapted to connect the interlocking grooves.

6. A flexible and reclosable food storage bag able to withstand a temperature range from below the freezing point of water to above the boiling point of water, the food storage container comprising:

- a bottom wall;
- a sidewall extending upwardly from the bottom wall, the bottom wall meeting the sidewall at a joint, an interior surface of the joint being arcuate, the sidewall terminating at an end opposite to the bottom wall at a top opening; and
- a closure mechanism mounted to the top opening.

7. The flexible and reclosable food storage bag of claim 6, wherein the container is made of silicone rubber.

8. The flexible and reclosable food storage bag of claim 7, wherein the container further includes thermostet resins.

9. The flexible and reclosable food storage bag of claim 6, wherein the side wall includes reinforcement members embedded therein.

10. The flexible and reclosable food storage bag of claim 9, wherein the top opening is circular.

11. The flexible and reclosable food storage bag of claim 9, wherein the top opening is oval.

12. The flexible and reclosable food storage bag of claim 6, wherein the closure mechanism is a lid.

13. The flexible and reclosable food storage bag of claim 6, wherein the closure mechanism includes interlocking grooves.

14. The flexible and reclosable food storage bag of claim 13, wherein the closure mechanism further includes a mechanical compression member adapted to connect the interlocking grooves together.

15. The flexible and reclosable food storage bag of claim 6, wherein the bottom wall and a bottom portion of the sidewall have a greater durometer rating than an upper portion of the sidewalls.

16. A flexible and reclosable food storage bag able to maintain structural integrity across a temperature range of at least as low as negative 20°F to at least as high as positive 450°F, the food storage bag having interior surfaces with curve and tangent continuity of at least one-half inch.

17. The food storage bag of claim 16, wherein the bag is made of silicone rubber.

18. The food storage bag of claim 16, wherein the bag further includes thermostet resins.

19. The food storage bag of claims 16, wherein the bag includes interlocking grooves as a closure mechanism.

20. The food storage bag of claim 19, further including a mechanical compression member.