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BAG ASSEMBLAGE

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ABSTRACT OF THE DISCLOSURE

A convenient opening feature for a bag assemblage is disclosed that minimizes product contamination when opening the bag. Such a feature comprises a gusset or inverse fold and a weakened tear line located within the gusset area. The gusset forms tabs that can be separately grasped to split the bag open along the tear line. Where the bag includes side seals extending from the edges of the gusset, further pulling causes a separation along the side seals allowing the walls of the bag to be peeled away from the product in a non-contacting manner. The weakened tear line can be a laminated structure with at least one ply and preferably the outer ply serrated, scored or otherwise weakened along a chosen line of rupture, and at least one ply having imperforate qualities to maintain the desired environment within the bag.

A typical bag assemblage in current usage comprises an envelope-like enclosure usually formed from flexible web material such as a plastic, or laminates including plastic, metal foil, paper and other commonly accepted packaging materials. Opening means in the form of pull strings, tapes, or serrated edges are usually incorporated in the bag structure for the more convenient opening thereof. While many are effective to various degrees of success, they are often poorly adapted for packages where the maintaining of a sterile product condition is demanded. The typical opening means of this nature frequently leave raw and uneven torn edges after opening so located as to interfere with the removal of the product from the bag assemblage. During removal contact can occur between the product and the unsterilized exterior surfaces of the bag, especially those surfaces in close proximity to the raw edges surrounding the opened or torn portion such that a contamination of the product results.

Another problem, particularly where a serrated or otherwise suitably weakened line forms the opening means, is that substantial resistance to tearing is often encountered despite the degree of weakening caused by the serrations. For instance, where a serrated line is applied to weaken a portion of the bag walls for tearing, it is often so arranged that the tear must be made across both the front and rear walls of the bag simultaneously, at least doubling the needed tearing effort. Furthermore, a convenient and entirely satisfactory gripping or tab means is often lacking thereby failing to locate the rupturing stress in the weakened portion of the bag upon the application of force by the user.

Accordingly, it is an object of the present invention to provide an improved bag assemblage having a convenient opening means that minimizes contact between the product and the exterior surfaces of the bag after opening and when removing the product therefrom.

Another object of the present invention is to provide an improved bag assemblage having edge seals, and a convenient opening means including a weakened portion so arranged in relation to the edge seals that the bag can be split open along its weakened portion and the walls of the bag separated along the edge seals and peeled back and away from the product in a non-contacting manner.

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Yet another object of the present invention is to provide an improved bag assembly wherein a convenient opening means is provided including a weakened portion having imperforate qualities to better maintain a desired environment within the bag.

Yet another object of the present invention is to provide an improved bag assemblage having a convenient opening means wherein a tab-like arrangement is provided to concentrate the opening stresses in a weakened portion which is thereby readily split or ruptured to gain access to the contents of the bag.

Yet a further object of the present invention is to provide an improved bag assemblage having a convenient opening means including a tab-like arrangement to locate a rupturing stress in a weakened portion along a single wall thickness of the bag.

Still a further object of the present invention is to provide an improved bag assemblage having a convenient means for resealing the bag after initial opening so that its remaining or unused contents can be stored in a protected condition.

Briefly then, the invention contemplates an improved bag assemblage including a convenient opening feature comprising an inverse fold or gusset across an edge of the bag, and a weakened tear line located within the gusset and preferably extending along the fold line. A bag assemblage so formed is conveniently opened by separately grasping the opposite legs of the gusset to split the bag along its weakened portion. Further pulling concentrates a stress in the side or transverse strip seals extending from the edge portions of the gusset causing a separation of the bag walls therealong. In this manner the walls of the bag can be peeled away from the product with a minimum chance of contact between the product and exterior surfaces of the bag. Where the product is in a liquid, particulated, or small whole form, the bag would generally be split only along the weakened line and the product poured from the bag, a natural spout being formed at each edge of the gusset by the merging front and rear walls. Where imperforate qualities are desired, the opening feature can comprise a laminate structure including at least one ply or coating (preferably the outer ply) which is serrated, scored or otherwise suitably weakened along the chosen line of rupture, and at least one other ply or coating which is imperforate to maintain the desired environment within the bag. The invention further envisions a resealing means located within the gusset area so that after initial opening the bag can be resealed to allow the unused portion of the product to remain in a more protected condition.

Other objects and advantages of the present invention and its details of construction will be apparent from a consideration of the following specification and accompanying drawings wherein:

FIGURE 1 is a schematic isometric view showing a method of forming in a continuous form, fill and seal operation, a bag assemblage and package embodying the principles of the present invention;

FIGURE 2 is an enlarged fragmentary isometric view of a package made in accordance with FIGURE 1 showing the gusset arrangement thereon;

FIGURE 3 is a view like FIGURE 2 only showing the convenient opening of the package;

FIGURE 4 is a view like FIGURE 3 only showing the package substantially opened and the walls of the bag assemblage separated along the seal areas and peeled back to expose the product contained therein;

FIGURE 5 is a cross-sectional view taken along reference line 5—5 of FIGURE 1 showing the weakened tear line construction of the package;

FIGURE 6 is a fragmentary isometric view of a modified form of the package; and

FIGURE 7 is a fragmentary isometric view of yet another modified form of the package.

Referring to FIGURE 1, there is shown a bag assemblage 10 and package 52 formed by suitably folding and intermittently sealing a continuous film web 12 having a weakened tear line 14 located along its longitudinal center line 16.

Web 12, having an upwardly facing heat sealable surface 18, is fed through horizontally arranged rollers 20 and 22 to an upwardly extending folding member 24, and side folding wheels 26 and 28. Folding member 24 assisted by side folding wheels 26 and 28 fold the web 12 downwardly along its longitudinal center line 16 to form a center or inverse fold 30. The side folding wheels 26 and 28 assisted by vertically arranged guide rollers 32 and 34 reversibly fold the edge portions 36 and 38 of web 12 upwardly to a height extending beyond the center fold 30, thereby forming a generally W-shaped web configuration collapsing as it is fed through guide rollers 32 and 34. The folded web 12, with its heat sealable surface 18 folded and collapsed together by guide rollers 32 and 34, is then intermittently heat sealed in the transverse direction to form side seals 40 connecting a plurality of bag assemblages 10.

The bag assemblages 10 include major walls 42 and 44 which are loose along their top edges to provide a fill opening 46, and secured together at each side edge by side seals 40. An edge gusset or fold 48 formerly comprising the center fold 30 of web 12 extends across the bottom edge or edge portion of the bag assemblage 10 separating therealong and in an enclosed fashion the major walls 42 and 44, and with the side seams 40 extending from adjacent each side of the gusset. Located and extending preferably along the center or inner fold line 16 of gusset 48 is the weakened tear line 14 as best illustrated in FIGURE 2.

If desired, at this point in fabrication a unit bag assemblage 10 can be obtained by separation of the folded and sealed web 12 along and within the side seal areas 40.

Alternately, and as shown in FIGURE 1, if a continuous form fill and seal operation is desired, the connected bag assemblages 10 are routed to a filling and sealing station indicated schematically by a downwardly pointing arrow 50. A package 52 is then obtained by containing the desired product within the bag assemblage 10 at the filling station after which a closing and securing of the fill opening 46 is effected, preferably by heat sealing along the top edge portions 54 and 56 of the major walls 42 and 44. Separation can then be had along and within the side seal areas 40 to furnish a unit package 52.

Tear line 14 preferably retains imperforate qualities and in one embodiment contemplates employing a laminate material construction having at least one ply weakened, as, for instance, by a line of serrations, to provide a line of rupture or tear line 14, and at least one ply non-perforated to serve as a barrier to the passage of vapors, fluids, or material through the walls of the bag assemblage 10 and particularly at points along its weakened tear line portion 14. To this end there is shown in FIGURE 5 a three-ply laminate material 58 including an outer ply 60 weakened by a line of serrations 59 along the desired path of the tear line 14. Outer ply 60 can comprise treated or non-treated paper, metal foil or similar common packaging materials that facilitate tearing along a line when serrated or which can be otherwise suitably weakened so as to rupture along a desired path. Additionally, it is probable in some applications of the present invention that the outer ply 60 would advantageously be a plastic as, for example, polyethylene, saran, polyvinyl chloride, regenerated non-porous cellulose, cellulose acetate, or other commonly employed plastic materials for packaging which can be weakened in satisfac-

tory fashion to provide for a predetermined separation along the tear line location.

Laminated in a suitable manner to the outer ply 60 is an intermediate ply 62 of preferably metal foil, as, for example, aluminum foil. Metal foil is desired for its generally high barrier qualities which substantially block the flow of vapors or fluids through the walls of the package 52 thereby preventing disturbances of the desired environment therewithin. In packages where high barrier properties are not particularly important, the intermediate ply 62 can be deleted for a cost advantage or possibly substituted with a less expensive material as, for example, a less expensive plastic or paper material.

The method selected for laminating outer ply 60 to the intermediate ply 62, of course, depends on the material comprising each ply. For laminating a paper outer ply 60 to an intermediate ply 62 of aluminum foil, suitable adhesives are well known and can be employed to do a satisfactory job. Properly selected adhesives would also be satisfactory for securing a plastic outer ply 60 to an intermediate ply 62 of metal foil. However, for a plastic outer ply 60 compatible with metal foil, sealing by means of heat wherein the plastic is fused to the metal foil would likely be used for more simplicity. In any event, it should be appreciated that the method of securing outer ply 60 to intermediate ply 62 is usually a matter of choice and preference to the individual manufacturer with a number of choices available as are well known to the art. Accordingly, it should be appreciated that the present invention is not limited by the lamination chosen.

Suitably laminated to the intermediate ply 62 is an inner ply 64 of preferably heat sealable material such as polyethylene, saran, or polyvinyl chloride which then comprises the heat sealable surface 18 of web 12 in FIGURE 1.

Generally, a thermoplastic intermediate ply 64 would be laminated to a metal foil intermediate ply 62 by the application of heat in cases where they are compatible. However, where an intermediate ply 62 is not desired as, for example, where the previously discussed high barrier properties are not merited nor a substitute intermediate packaging material not desired, the plastic inner ply 64 can be laminated directly to the outer ply 60. Plastic, especially certain compositions like polyvinyl chloride or saran, do have reasonably fine barrier properties and if applied to the outer ply 60 without employing an intermediate ply 62, a measure of imperforate barrier qualities would still be obtained. In this arrangement the laminating of the inner ply 64 to the outer ply 60 can be by heat sealing in many applications as, for example, when the outer ply comprises a metal foil or a plastic suitably compatible with the plastic or metal foil comprising the inner ply 64. Laminating by heat to a paper outer ply 60, of course, is a possibility where the paper employed has sufficient properties to withstand the heat applied without deteriorating in quality. Additionally, suitable adhesives, solvents, and other satisfactory laminating techniques are well known and can be selected for the material to be laminated to effect a satisfactory bond between the plies.

While side seals 40 are preferably formed by the application of heat and thereby require an inner ply 64 of heat sealable material, it is conceivable that pressure or hot melt adhesives could be employed to seal the bag assemblage 10 along the sides. In these applications, of course, a heat sealable inner ply 64 would not be necessary. For instance, in packages where only an outer paper ply 60 and metal foil intermediate ply 62 are desired, the side seals 40 could be formed by programming along the transverse areas of the web to be sealed, a suitable adhesive, solvent or other commonly employed and applicable sealing substance. Thus, while the invention has been described in particularity with regard to a web 12 having an upper heat sealable surface 18 it is by no means intended to limit the invention to this material construction and it would be but a simple matter for one skilled in the art and in view of the disclosure herein to obtain a bag assemblage

10 were adhesives or other sealing means were employed to effect the side seals 40.

FIGURES 3 and 4 pictorially show the convenient opening of the bag assemblage 10 as embodied in package 52. As shown in FIGURE 3, the gusset 48 forms separate tabs 66 and 68 that can be separately grasped to locate a stress in the tear line 14. In this manner, the bag can be split open along tear line 14 to expose the product contained within the bag assemblage 10. It will be seen that further pulling concentrates its stress force in the side seal area 40 causing a separation of the major walls 42 and 44 along the seal areas 40. As illustrated in FIGURE 4, the package 52 is split along the tear line 14 and the major walls 42 and 44 separated along the side seal areas 40 and peeled back and away from the product. The product shown can comprise, for example, a moist towlette, sponge or the like, saturated with an agent, as, for example, an antiseptic agent, suitable for cleaning wounds and cuts and desirably maintained in a sterile condition during the operating of package 52 and the removal of the product therefrom. Thus, the peeling back of the major walls 42 and 44 substantially exposes the product in a sterile condition non-contacted by the torn edges about the opening of tear line 14 or the exterior surface portions of package 52.

Where it is desired to be able to strip the seal areas 40 in the above-illustrated manner it is important that the seal 40 give or separate before a failure of the major walls 42 and 44. This aspect goes essentially to the degree of strength in the seal and the strength of the major walls 42 and 44. In embodiments where essentially a non-stretchable paper or metal material comprises the outer ply 60 and intermediate ply 62 no real problems have been experienced in this respect. Of course, if the paper and aluminum employed is formed too thin, a tearing of the major walls 42 and 44 might be experienced prior to separation along the seal area 40. If this is experienced, correction of the problem can be obtained by lessening the strength of the side seal 40 or alternately by increasing the strength and thickness of major walls 42 and 44. For instance, where a heat sealable inner ply 64 is employed, plastics such as saran, which do not generally form an exceptionally strong bond, can be used. Alternatively, the strength of the seal can be changed somewhat by varying the temperature of heat applied to the seal area and the dwell time or time that the heat is being applied. This, of course, varies the amount of fusing between the heat sealable materials effecting the strength of the seal. Where a stretchable plastic comprise the major walls 42 and 44 these same principles would apply and a correction can be made by adjusting the thickness or strength of the material in relation to the strength of the seal so that separation is had along the seal area 40 rather than a failure or tearing apart of the material at forces less than those necessary to separate the side seals 40.

FIGURE 6 illustrates a modified form of the invention including a bag assemblage 70 having along one edge portion thereof a gusset 72 similar in construction to gusset 48 of bag assemblage 10. A modified tear line 74 extends longitudinally across the gusset 72 and preferably along its fold line so as to intersect the side seals 82. Tear line 74 comprises a score line 76 merging at each edge portion of gusset 72 with edge notches 78 and 80 located within the side seal areas 82. The notches 78 and 80, if desired, can extend entirely through the gusset material at these edge locations since the notches are contained within the side seal areas 82 and thus would not impair the imperforate qualities of tear line 76. The score line 76 can be effected in plastic or metal foil materials by a heating and pressuring step to somewhat stretch and thin the gusset material along the desired tear line path and thereby form a weakened line of rupture. A weakening in this manner is particularly well suited where it is desired to employ only a single ply material bag assemblage construction since even though stretched and thinned somewhat, the tear line 74 maintains a degree of imperforate

qualities. The convenient opening of bag assemblage 70 is accomplished in a manner similar to that of bag assemblage 10. The gusset 72 provides separate tabs 84 and 86 that can be separately grasped preferably adjacent one of the edge notches 78 and 80 and pulled to split the bag assemblage 70 along the weakened tear line 74 as well as along the side seal areas if it is desired to cause a separation therealong.

A further modification of bag assemblage 70 provides traverse gusset seals 83 and 85 located along opposite sides of tear line 74 and spanning the width of gusset 72 to merge at the edge portions thereof with side seals 82. The function of gusset seals 83 and 85 is to seal off portions of the gusset inner space from the product receiving cavity of bag assemblage 70 defined between the opposed interior surfaces of its major walls 87 and 89. Gusset seals 83 and 85 by securing together therealong gusset 72 and the major walls 87 and 89 effectively accomplish this purpose. Consequently, when particulated, small whole or liquid products are contained within bag assemblage 70, gusset seals 83 and 85 prevent their seepage or entrance into the sealed-off portions of the gusset 72 to better maintain clearly defined tabs 84 and 86. Gusset seals 83 and 85 can be formed by the application of heat where sufficiently compatible heat sealable interior surfaces are provided along their locations, or, if desired, by other properly selected sealing techniques, as, for example, by employing suitable adhesives or solvents.

FIGURE 7 illustrates another modified form of the invention wherein the gusset arrangement is merged and secured at each edge in a unitary seam with the side seals of the bag assemblage. This arrangement can be formed in a manner similar to gusset 48 of bag assemblage 10 and simultaneously with the transverse sealing step where the exterior surface as formed of the web material, as, for example, the lower surface 17 of web 12 of FIGURE 1, comprises heat sealable material.

Specifically in FIGURE 7 there is provided a bag assemblage 90 including major walls 92 and 94 secured together at each side edge by side seals 95. A gusset 96 extends along an edge of bag assemblage 90 and is secured together at each of its edge portions in a unitary seam with the side seals 95. A weakened portion or tear line 98 extends across gusset 96 preferably along its fold line. Tear line 98 is somewhat modified in that it envisions at least a two-ply laminated gusset material construction where one of the plies and preferably the outer ply or coating is completely severed along the desired path of rupture or path of tear line 98. This can be most advantageously accomplished when fabricating the web material itself. For instance, in a two-ply web structure a weakened line of this nature can be obtained by laminating to a single web, two webs whose inner edges are abuttingly engaged. Thus, the separate webs abutting at their inner edges comprise the weakened ply of the laminated web material employed to form bag assemblage 90 with the web they are laminated to, furnishing the ply having the desired imperforate or barrier properties.

Package 90 additionally concerns a resealing means 100 that allows the unused portion of the product to be maintained in a more protected condition after initial opening. The concept of resealing means 100 pertains to a pressure sensitive area within the gusset 96 that can be pressured against the gusset surface located opposite thereto to reseal the bag assemblage 90 after opening. Toward this end the pressure sensitive tape or adhesive area 102 is provided extending longitudinally along an exterior side area of the gusset 96 and which area may extend across the entire edge width of the bag assemblage. The adhesive material is the type which retains the adhesive powers after exposure to the atmosphere and which will stick to another surface or the other side of the gusset merely by the application of pressure. A protective covering 104 can be positioned atop the adhesive area which covering is purposefully easily removed when it is desired to close

the bag 90, but it is so located within the gusset 90 as to minimize an accidental removal.

While certain representative embodiments and details have been shown for the purpose of illustrating the invention, it will be apparent to those skilled in the art that various changes and modifications can be made therein without departing from the spirit and scope of the invention.

Accordingly, what is claimed is:

1. A bag assemblage having an opening device comprising an inverse fold along an edge portion of the bag assemblage to form an edge gusset, a tear line located within said edge gusset, said inverse fold providing tabs that can be separately grasped and pulled to locate a rupturing stress in said tear line to split the bag assemblage open therealong, said tear line being formed in a laminate material comprising at least one ply weakened along the path of the tear line to cause rupturing along said path, and at least one ply securely joined to said weakened ply and having imperforate qualities to provide said bag assemblage with barrier qualities at the tear line location.

2. The bag assemblage of claim 1 wherein said bag assemblage comprises opposed major walls separated and closed across an edge portion thereof by said gusset, seams extending from adjacent the opposite sides of said gusset, respectively, and edgewise securing together said major walls, said tear line being located along the inner fold line of said gusset such that by activation of the opening device a stress force is concentrated in said seals to rupture the seals, thereby allowing the major walls to be peeled away from each other.

3. The bag assemblage of claim 2 wherein said gusset is secured together at each side in a unitary seam with said seals.

4. The bag assemblage of claim 1 wherein said laminate material comprises an outer ply of paper weakened by a series of serrations along the path of said tear line,

an intermediate ply of metal foil laminated to said paper ply, and an inner ply of plastic laminated to said metal foil and furnishing a heat sealable inner surface.

5. The bag assemblage of claim 1 wherein said weakened ply comprises a score line formed by a thinning and weakening of the bag assemblage material along the path of the tear line.

6. The bag assemblage of claim 5 wherein said score line merges with an edge notch to facilitate initial tearing along the score line.

7. The bag assemblage of claim 1 wherein an adhesive area is located within said gusset to provide for a resealing of the bag assemblage after initial opening.

8. The bag assemblage of claim 1 wherein interior space adjacent the gusset area of said package is sealed off from the main product receiving cavity to prevent entrance of the product into the sealed off space.

9. The bag assemblage of claim 1 wherein a portion of said fold intermediate of the side seals is secured to said major walls.

10. The bag assemblage of claim 1 including a product secured within said bag assemblage to provide a package having said opening device.

11. The bag assemblage of claim 1 wherein said imperforate ply comprises a coating of material.

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