TRASH BAG FOR WET TRASH

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ABSTRACT
A trash bag for containing wet trash has an outer ply of fluid imperious material defining an outer front wall and an outer rear wall of the bag, and an inner ply of fluid pervious material defining an inner front wall and an inner rear wall of the bag. The inner and outer plies form a compartment between them which contains a highly fluid absorbent material. The material is capable of capturing any fluids that enter the compartment from the interior of the bag thereby minimizing fluid leakage from the bag in the event that the outer ply of the bag is breeched. The material in the compartment may be combined with or include any of a variety of additional substances designed to act on, react to or counter the effects of fluids absorbed by the material.
TRASH BAG FOR WET TRASH
CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present application is a continuation-in-part of commonly assigned copending U.S. patent application Ser. No. 11/107,514, which was filed on Apr. 15, 2005, by Jay Jacoby et al. for a TRASH BAG FOR WET TRASH and is hereby incorporated by reference.

BACKGROUND OF THE INVENTION
Field of the Invention

[0002] This invention relates to a plastic trash bag. It relates especially to a trash bag for handling trash with a high moisture content and commonly referred to as wet trash.

Background Information

[0003] Most commercial and residential trash receptacles are provided with a liner consisting of a plastic trash bag. Often, trash with a significant fluid content, i.e., wet trash, is thrown into these receptacles. This is particularly so in the case of receptacles located in public places such as parks, transportation terminals, malls and other areas located near retail food outlets. When that occurs, fluids collect at the bottoms of the standard trash bags or liners particularly as they are removed from their receptacles for disposal. Often, the welded seams of these bags are not able to withstand the weight of the contained fluids and consequently the fluids frequently leak out of the bags.

[0004] Also, in many metropolitan areas, trash bags are typically dragged across sidewalks to the curb for overnight collection. In some cases, the action of dragging the bags can puncture the bag allowing the bag contents to leak out creating a public health hazard as the exposed fluids and the punctured bag reposing at curbside can attract rodents, flies and other pests. In an attempt to overcome these problems, some receptacles have been fitted with heavy duty trash bags or liners having a greater wall thickness. While such bags are better able to withstand frictional forces due to dragging of the bag, they still leak when punctured by a sharp object. Also the weight of fluids in the bags can still cause leakage at the bag seams.

SUMMARY OF THE INVENTION

[0005] Accordingly, the present invention aims to provide an improved trash bag for containing wet trash.

[0006] Another object of the invention is to provide a bag of this type which is especially adapted to serve as a liner for commercial trash receptacles.

[0007] Another object of the invention is to provide a trash bag which suffers minimum leakage even when punctured by an external object.

[0008] A further object of the invention is to provide a trash bag for containing wet trash which does not tend to leak even if a bag seam should be compromised to some extent.

[0009] Other objects will, in part, be obvious and will, in part, appear hereinafter.

[0010] The invention accordingly comprises the features of construction, combination of elements and arrangement of parts which will be exemplified in the following detailed description, and the scope of the invention will be indicated in the claims.

[0011] Briefly, the bag comprises an outer layer or ply of fluid impervious sheet material and an inner ply or layer of fluid pervious sheet material. The inner ply or layer occupies at least a portion of the bottom of the bag and is smeared to the outer layer to form a compartment between the two plies or layers which contains a layer of highly absorbent material. When wet trash is placed in the bag, the fluid content of that trash will penetrate the pervious inner ply of the bag and will be absorbed by the absorbent layer. Therefore, even if the outer wall of the bag should be breached, since the fluids have been bound to the absorbent layer, there should be no leakage from the bag. The same is true if a bag seam is compromised due to the weight of fluids collected at the bottom of the bag. If desired, other substances such as a deodorizing agent, a neutralizing agent or the like may be included in the compartment to complement the fluid absorbing capacity of the bag.

[0012] Since it does not tend to leak, the present bag is especially suitable as a liner for receptacles in kitchens, HAZMAT facilities, hospitals, restaurants, airports, schools, and other locations where wet trash is discarded on a regular basis.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] For a fuller understanding of the nature and objects of the invention, reference should be made to the following detailed description taken in connection with the accompanying drawings, in which:

[0014] FIG. 1 is a side elevational view with parts broken away showing a trash bag or liner incorporating the invention;

[0015] FIG. 2 is a sectional view, on a larger scale, taken along line 2-2 of FIG. 1, and

[0016] FIG. 3 is a top plan view of the components for making a second bag embodiment according to the invention.

DETAILED DESCRIPTION OF ILLUSTRATIVE EMBODIMENTS

[0017] Referring to FIGS. 1 and 2 of the drawings, the subject bag comprises an outer ply or layer 12 of a flexible fluid impervious sheet material. Layer 12 includes a front wall 12a and a rear wall 12b which are formed by folding the sheet material at a fold line 12c at the bottom of the bag. The ply or layer 12 is preferably made of a plastic sheet material such as polyethylene, polypropylene or the like. Depending upon the desired bag strength, the ply 12 may have a thickness of 0.5 to 1.5 mils for example.

[0018] The bag also includes an inner ply or layer 16 of a flexible sheet material. Like ply 12, ply 16 is folded to form front and rear walls 16a and 16b and the upper edges of those walls are secured to walls 12a and 12b by transverse bonded or welded seams 18a and 18b to define a compartment 22 between the two plies 12 and 16, respectively. While the inner ply walls 16a and 16b are shown as
extending about a third of the way up from the bottom of the bag, it should be understood that those walls could extend higher or even all the way to the top of the bag in which case the seams 18a and 18b would be located at or near the top of the bag. Alternatively, the inner ply walls 16a and 16b can be located low in the bag so that the compartment 22 occupies only the bottom of the bag where the fluid in the trash is most likely to accumulate.

[0019] In accordance with the invention, ply 16 is impervious or impermeable to water and other fluids. In the illustrated bag, ply 16 is of the same impervious material as ply 12 but is provided with a multitude of small holes or perforations 24 which allow fluid to flow from the interior of the bag into the compartment 22. However, ply 12 could just as well be of a woven plastic sheet material which can be penetrated by water and other fluids.

[0020] As shown in FIGS. 1 and 2, the compartment 22 contains a fluid-absorbing material 26 in the form of a flexible layer capable of absorbing and retaining water and other fluids that may flow into compartment 22 through holes 24. Preferably, material 26 is a super absorbent material capable of absorbing at least one gallon of a fluid such as water in each 12.5 square feet of material 26. A suitable super absorbent material available in sheet form is a cross-linked polyacrylate. Of course, compartment 22 could just as well be filled with a granular absorbent material such as sodium poly-2-propenonate marketed by Dow Chemical Co. under the designation DRYTECH. Other known absorbent or super absorbent polymers and copolymers may be envisioned for use in compartment 22. One particularly economical, environmentally friendly substance for the material 26 would consist of finely shredded, recycled newspaper which may be treated or combined with a suitable desiccant to improve its absorptive capacity.

[0021] Still referring to FIGS. 1 and 2, when making the illustrated bag, before the outer ply 12 is folded is aresoid, the laminar absorbent material 26 and inner ply 16 are laid onto ply 12 and centered between the edges of that last ply. Then ply 16 is secured to ply 12 at seams 18a and 18b. Following that, the various plies or layers are folded at the fold line 12c and the side edges of the outer ply walls 12a and 12b are secured together by seams 28a and 28b at the opposite sides of the bag. When formed thusly, the bag may serve as a stand alone trash bag or as a liner for use in residential and commercial trash receptacles.

[0022] The bag may be made of any size and adapted to hold any desired volume of wet trash. Relatively large volume bags, sized to hold in the range of 10 to 50 gallons or more, may be made for high volume commercial or industrial applications. Small bags, sized to hold volumes measured in ounces, are also possible. One application of a small volume bag according to the invention is as a pet waste receptacle. Such a bag could be turned inside out and placed over the hind of the pet’s handler, and used to pick-up the pet’s waste. The bag would then be turned inside in to capture the waste securely and sanitarily in the bag.

[0023] Either the inner ply 16 or the outer ply 12 of the bag may be expandable so that the effective volume of the compartment 22 increases as fluid is absorbed in the material 26. This expandability can be achieved in a number of different ways. One way is to make the material of the inner ply 16 or the outer ply 12, or both, relatively elastic so as to stretch under the load of the absorbed fluid. Alternatively, either or both plys 16 and 12 may be folded, corrugated or pleated so as to unfold and expand in response to the load.

[0024] For some applications, the bag may include one or more substances 30 in compartment 22 as shown in FIG. 2, which substances can act on or react to or counter the effects of the fluids absorbed by material 26. For example, substance 30 may be a deodorizing or scenting agent which can suppress or mask odors produced by the fluids. Substance 30 could also be or contain a disinfectant, germicide or antibacterial agent. Similarly, substance 30 may be or include a known agent for neutralizing the toxicity, acidity, alkalinity, etc. of the fluids expected to be absorbed by material 26 in view of the bag’s location, e.g., in a laboratory. Substance 30 could also be a catalyst or reactant which promotes the transformation of selected components of the fluids. Other substances that produce other desirable effects may be envisioned for use with material 26 in compartment 22.

[0025] By way of example, the substance 30 may include a chemical reagent 30 having the ability to treat contaminated trash added to the bag, to stabilize environmentally harmful heavy metals in the trash, such as lead, mercury and the like. The chemical reagent, for example, may comprise a mixture of an inorganic sulfide, calcium phosphate and calcium carbonate, as described in U.S. Pat. No. 5,898,093. Because the bag is particularly well adapted to handle wet trash, water may be added to the bag, as taught in that patent, to enhance the decontamination process. Because of the bag’s two-ply construction and absorbent material 26, the risk of leakage of the trash, even after treatment, is minimized.

[0026] The outer ply 12 and/or inner ply 16 may also be made of a substantially transparent plastic sheet material. The substance 30 may be a chemical reagent, such as a litmus agent, which is adapted to change color in response to fluids having a particular property or condition, to the presence of a particular compound or composition in the fluids, or to the existence of a relative concentration of the particular compound or composition in the fluids. A visible inspection of the bag after the fluid is added and interacts with the substance 30 would thus be indicative of the presence of the property, condition, compound, composition, or concentration of the same, in the added fluids.

[0027] The bag shown in FIGS. 1 and 2 has seams at opposite sides of the bag. In other bag constructions, seams may be located at the bottom and one side only of the bag. FIG. 3 shows the layer layout for making such a bag. As seen there, the layer of absorbent material 26 and the inner ply 16 are placed on outer ply 12 with the lower edges of those layers in register. Then, those layers are folded along a vertical fold line F midway between the side edges of those layers. That folding forms the front and rear walls of the plies, the bottom and right side edges of which may be welded or bonded together to complete the bag.

[0028] It will be appreciated from the foregoing that when wet trash is thrown into the present bag, the bag is able to separate fluids from the solid trash by allowing the fluids to flow into the compartment 22 and be captured by the absorbent material 26 therein. Any fluid volume that may be in excess of the absorbing capacity of material 26 will still be trapped by the bag’s fluid impervious outer ply 12. On the other hand, if the outer ply 12 or the seams 28a, 28b should
be compromised, any leakage from the bag will be minimal because most or all of the fluid is captured in absorbent material. As a result, the bag helps to prevent liquid contaminants from being introduced into an otherwise clean environment. This is particularly important in commercial food preparation areas, hospitals, nursing homes and the like where contamination could result in a serious health hazard.

It will thus be seen that the objects set forth above among those made apparent from the preceding description are efficiently attained. Also, since certain changes may be made in the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention described herein.

What is claimed is:

1. A trash bag comprising
   an outer ply defining an outer front wall and an outer rear wall of the bag, said outer ply being fluid impervious;
   an inner ply defining an inner front wall and an inner rear wall, said inner ply being fluid pervious, said inner and outer plies defining a compartment between them, and
   a fluid absorbent material in said compartment for absorbing any fluids that enter the compartment from the interior of the bag.
2. The bag defined in claim 1 wherein the inner ply and absorbent material occupy at least the bottom third of the bag.
3. The bag defined in claim 1 wherein the outer ply comprises a plastic sheet.
4. The bag defined in claim 3 wherein the plastic sheet is of polyethylene or poly-propylene.
5. The bag defined in claim 1 wherein the inner ply is a perforated plastic sheet.
6. The bag defined in claim 1 wherein the inner ply is of a fluid permeable woven plastic material.
7. The bag defined in claim 1 wherein the fluid absorbent material is a super absorbent in layer form.
8. The bag defined in claim 1 wherein the fluid material is a super absorbent in granular form.
9. The bag defined in claim 1 wherein the inner and outer plies have opposite side edges which are bonded together.
10. The bag defined in claim 1 wherein the inner and outer plies have bottom edges which are bonded together.
11. The bag defined in claim 1 and further including a substance in said compartment capable of interacting with or counteracting the effects of fluids absorbed by said material.
12. The bag defined in claim 11 wherein the substance includes a deodorant.
13. The bag defined in claim 11 wherein the substance includes a disinfectant.
14. The bag defined in claim 1 wherein the material in said compartment comprises of finely shredded, recycled newspaper.
15. The bag defined in claim 13 further including a desiccant material in said compartment.
16. The bag defined in claim 1 wherein at least the portion of said outer ply defining said compartment is expandable.
17. The bag defined in claim 1 wherein at least the portion of said inner ply defining said compartment is expandable.
18. The bag defined in claim 1 wherein at least the portions of said outer ply and said inner ply defining said compartment are expandable.
19. The bag defined in claim 11 wherein said substance comprises a chemical reagent for treating contaminated trash.
20. The bag defined in claim 11 wherein at least said outer ply comprises a substantially transparent sheet.
21. The bag defined in claim 21 wherein said substance comprises an agent which changes color in response to a condition or property of the fluids absorbed by said material.