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GUSSETED MULTI-WALL WATERPROOF PAPER BAG

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FIG. 1

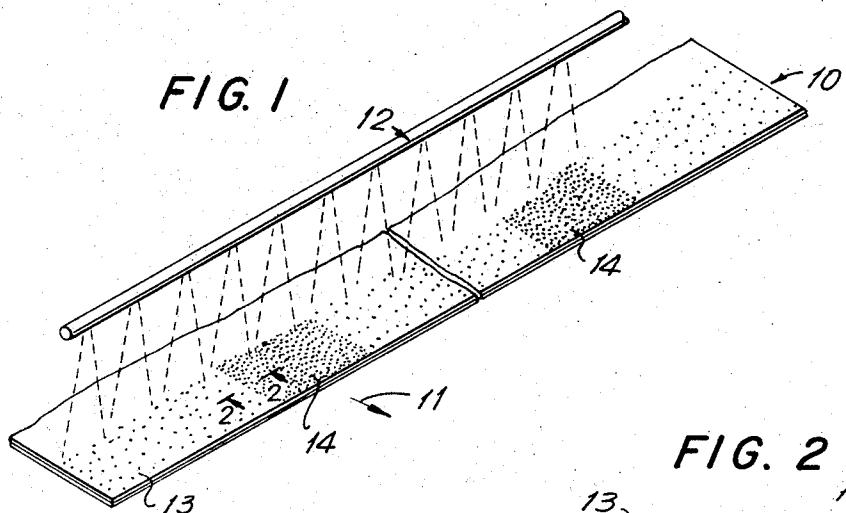


FIG. 2

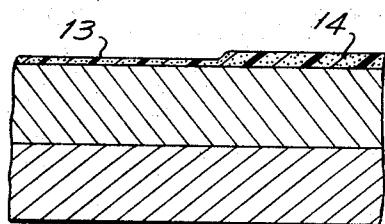


FIG. 3

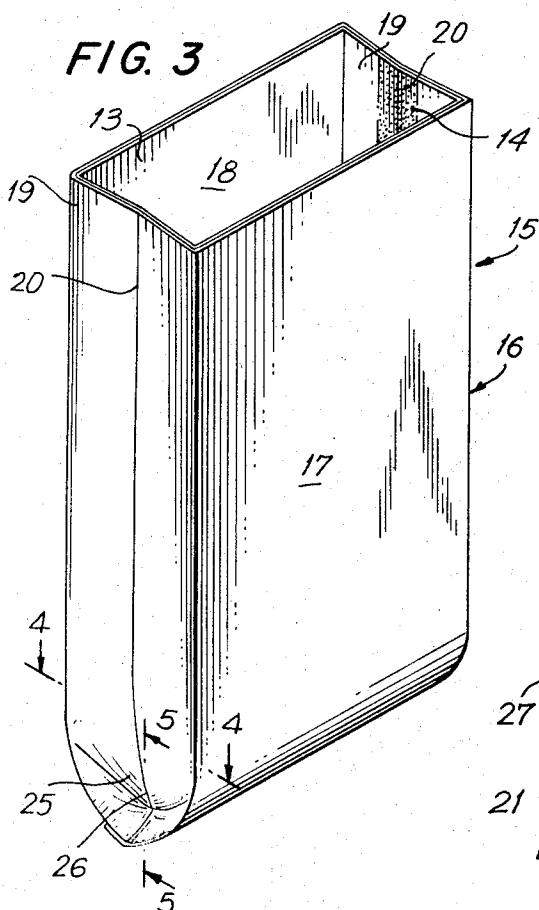
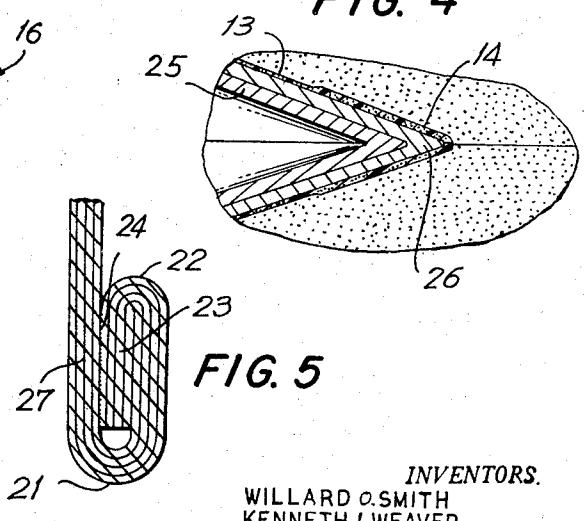


FIG. 4



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## GUSSETED MULTI-WALL WATERPROOF PAPER BAG

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3 Claims. (Cl. 229—55)

### ABSTRACT OF THE DISCLOSURE

This disclosure is for an improved gusseted multi-wall waterproof paper bag of liquid-proof qualities with reinforcements and more perfect liquid proofing in zones extending longitudinally along the central folds of the gussets by applying additional thickness of coating of thermoplastic material at said zones.

This invention relates generally to bags, and is especially concerned with unique improvements in waterproof paper bags.

It is an important object of the present invention to provide a waterproof paper bag which is capable of receiving and containing refuse and garbage, even wet and sharp objects, without leakage or rupture, and which can be economically manufactured for sale at a reasonable price to justify single usage and disposal thereof.

It is another object of the present invention to provide a garbage and refuse collection bag which is extremely simple to use, durable and reliable throughout its required life, and which incorporates unique features of construction affording a greatly increased resistance to leakage and rupture.

Other objects of the present invention will become apparent upon reading the following specification and referring to the accompanying drawings, which form a material part of this disclosure.

The invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts, which will be exemplified in the construction hereinafter described, and of which the scope will be indicated by the appended claims.

In the drawings:

FIGURE 1 is a partial perspective view illustrating a unique step in manufacture of a bag constructed in accordance with the teachings of the present invention.

FIGURE 2 is a fragmentary sectional view taken generally along the line 2—2 of FIGURE 1.

FIGURE 3 is a top perspective view illustrating a bag of the present invention in its open condition.

FIGURE 4 is a partial sectional view taken generally along the line 4—4 of FIGURE 3.

FIGURE 5 is a partial sectional view illustrating the closed lower end fold of the bag of FIGURE 3.

Referring now more particularly to the drawings, and specifically to FIGURE 1 thereof, a web of multi-ply paper is there generally designated 10, and is fed lengthwise, as in the direction of arrow 11, beneath a coating apparatus 12 adapted to spray or otherwise apply thermoplastic material onto one face of the web 10, substantially completely covering the web face. Further, the coating apparatus or sprayhead 12 is configured to deposit a layer or coating 13, best seen in FIGURE 2, of a predetermined thickness, over the entire upper surface of the web 10. In addition, along a pair of laterally spaced, longitudinally extending zones 14 of the web, an additional thickness or coating of thermoplastic material is applied, see FIGURE 2. The thermoplastic material of the coatings 13 and 14 may be polyethylene, or other suitable waterproof sealing material, and the sprayhead 12 may be provided with additional

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orifices or nozzles in the regions above zones 14 to deposit additional thermoplastic material on the zones. In practice, it has been found satisfactory to form the coating 14 of between five and ten pounds per ream more coating material than the remainder of the coating 13.

From the coating apparatus 12, the web 10 may pass to a conventional tubing machine, which forms the web into a continuous longitudinal tube by adhesively sealing together opposite longitudinal edge margins of the web. In particular, the separate plies of the web 10 may be respectively adhesively secured together at their opposite longitudinal margins. The tube is folded longitudinally at opposite sides thereof, as will be described hereinafter more fully, subsequently cut into bag lengths, and one end of each bag length folded transversely to form a closed bottom. A resultant bag is shown in FIGURE 3, there generally designated 15.

The bag 15 is formed of a tube 16 folded to a generally rectangular transverse cross section defining a pair of longitudinally extending, facing front and back walls 17 and 18, and a pair of longitudinally extending opposed side walls 19, each extending between and connected to the facing walls 17 and 18 along opposite side edges thereof.

The entire interior surface of the tube 16 is coated with thermoplastic material, as the web 10 is formed to place the coating interiorly of the tube. Further the thinner layer of coating 13 is located on the inner faces of the front and back walls 17 and 18, while the zones of thicker or heavier coating 14 extend longitudinally along the inner surfaces of the side walls 19, and may be spaced intermediate the front and back walls 17 and 18, as seen in FIGURE 3.

Each side wall 19 is formed with an inwardly projecting fold 20 extending longitudinally along the respective side wall and spaced medially between the front and back walls 17 and 18. The folds 20 thus provide for collapse of their respective side walls 19 into position between the facing front and back walls 17 and 18, and extension or unfolding of the side walls to space the front and back walls away from each other.

The lower end of the tube 16, with the side walls 19 collapsed between the front and back walls 17 and 18, is folded upon itself, as by the double folds 21 and 22, best seen in FIGURE 5. The folded lower end portion 23 of the bag 15 may be secured in its folded condition, extending transversely across the bag between the side edges thereof, by adhesive 24 applied to the external surfaces of the bag. Also, the facing interior surfaces of the lower end portion are heat-sealed together by activation of the coating material.

As the transverse lower end folds 21, 22 are formed with the side walls 19 collapsed flat between the facing walls 17 and 18, it will be apparent that the bag 15 is essentially flat in its collapsed or closed condition. Upon opening of the bag 15, as by spreading or spacing of the front and back walls 17 and 18, the side walls 19 open to a substantially flat condition, by unfolding of the folds 20. However, in the lower region of each side walls 19, as at 25, the longitudinally medial side wall region or lower fold portion 26 is anchored by the folds 21, 22 at a laterally inward location. Heretofore, it was at this lower fold region 26 that leakage or rupture most occurred upon opening, flattening or spreading of the lower side wall region 25 in the form of an expanding gusset. However, by virtue of the relatively thick coating 14 over this lower side wall fold portion 26, and the adjacent regions, a positive seal is effected by heat-sealing together of the facing interior surfaces, as at 27 in FIGURE 5, during formation of the folds 21 and 22. This internal sealing at 27 positively prevents leakage or seepage, while the additional thickness coating 14 assures effective sealing and reinforces

the lower fold region 26 of the gusset 25 upon flexure thereof against cracking or rupture.

From the foregoing, it is seen that the present invention provides a bag construction which fully accomplishes its intended objects and is well adapted to meet practical conditions of manufacture and use.

Although the present invention has been described in some detail by way of illustration and example for purposes of clarity of understanding, it is understood that certain changes and modifications may be made within the spirit of the invention and scope of the appended claims.

What is claimed is:

1. A gusseted multi-wall waterproof paper bag comprising a tube having facing front and back walls and side walls extending between said front and back walls, a coating of thermoplastic material on the entire inner surface of said tube, there being an inwardly projecting gusset fold in each side wall spaced intermediate said front and back walls for collapse and extension of said side walls between said front and back walls, an additional thickness of coating of thermoplastic material on the inner surface of each side wall defining a zone extending along its central gusset-fold, one adjacent pair of ends of said front and back walls having collapsed side walls interposed therebetween being folded upon itself extending across

said tube to provide a bag bottom, said side walls adjacent to said bag bottom defining expansile gussets having said additional coating to resist leakage and rupture, said folded ends being heat-sealed together by said thermoplastic material.

5 2. A waterproof bag according to claim 1, in combination with adhesive on the external surfaces of said front and back walls further securing said end fold.

10 3. A waterproof bag according to claim 1, said thermoplastic material being polyethylene, and said additional coating being between five and ten pounds per ream more than said first-mentioned coating.

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