

M. SMETANA.
IMPERVIOUS BAG.
APPLICATION FILED JUNE 25, 1913.

1,092,601.

Patented Apr. 7, 1914.

FIG. 2.

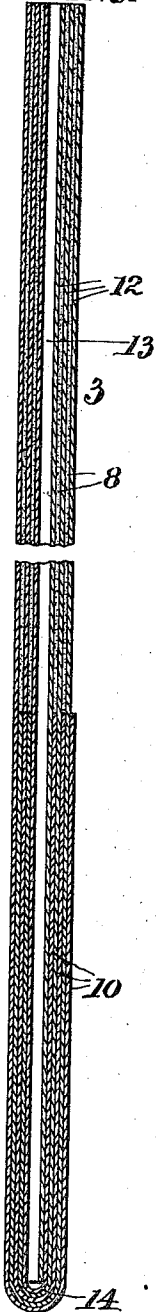


FIG. 1.

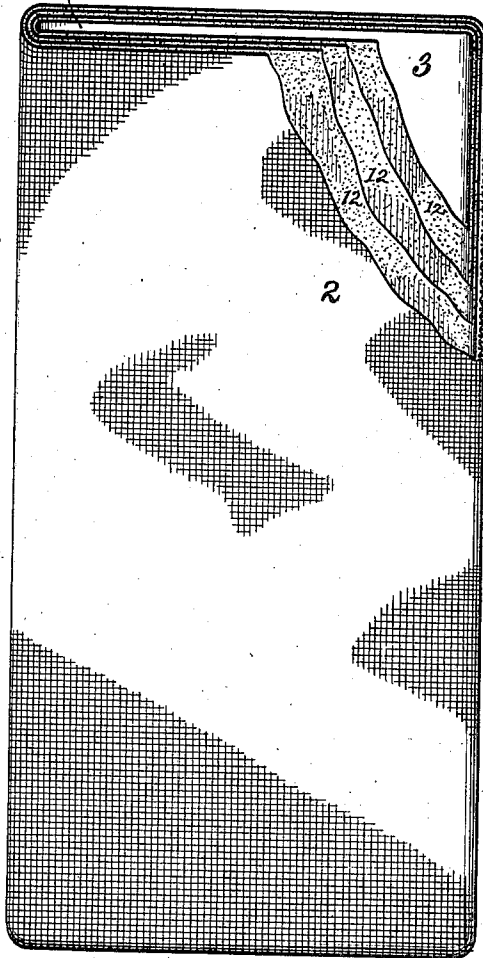


FIG. 3.

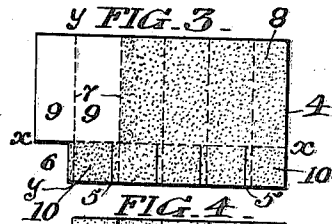


FIG. 4.



FIG. 5.

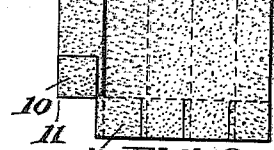


FIG. 6.

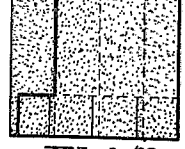


FIG. 7.



FIG. 8.



FIG. 9.

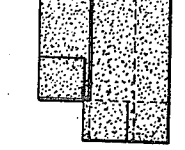


FIG. 10.

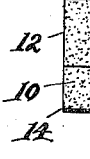
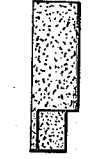
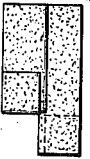
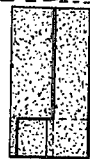
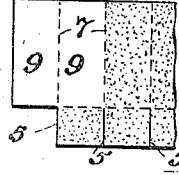


FIG. 14.



Witnesses

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By

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UNITED STATES PATENT OFFICE.

MAXIMILIAN SMETANA, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO WILLIAM C. WITTMAN, OF PHILADELPHIA, PENNSYLVANIA.

IMPERVIOUS BAG.

1,092,601.

Specification of Letters Patent.

Patented Apr. 7, 1914.

Application filed June 25, 1913. Serial No. 775,652.

To all whom it may concern:

Be it known that I, MAXIMILIAN SMETANA, subject of the Emperor of Austria-Hungary, and resident of Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented an Improvement in Impervious Bags, of which the following is a specification.

The object of my invention is to provide a construction of impervious bag, suitable for storing and shipping hydraulic cement, lime and substances in loose form which have moisture absorptive or deliquescent properties which result in the deterioration of the material unless it is kept in a thoroughly dry condition.

In the use of Portland or other hydraulic cement, for example, the necessity of storing the same in large quantities for long periods of time and the transportation of it over long distances, under more or less exposed conditions, and the commercial use of the cement in building operations where the bags are exposed to the inclement weather conditions which cannot well be guarded against, the moisture absorbed soon renders the cement unfit for use; and if these conditions are guarded against, the cost becomes prohibitory. By the use of my improved bag, the cement may be preserved for long periods of time under the most adverse conditions without losing any of its essential qualities.

Moreover, my object is also to so form the bag that it will withstand the roughest usage without danger of rupture of the moisture-proof envelop or container.

My invention consists of a fabric outer bag, which may be of coarse textile material of inexpensive construction, combined with a specially constructed inner container envelop or bag for the cement or other material, consisting of a sheet of paper or other suitable material folded upon itself a number of times to form a multiple-ply body having its bottom closed by extensions of each successive ply folded over against the opposite sides alternately, and said inner container having the several plies and folded parts coated with a suitable impervious compound which performs the dual function of rendering the walls of the container impervious to moisture and cementing the plies thereof together.

My invention also comprehends other fea-

tures of construction which, together with these above specified, will be better understood by reference to the drawings, in which:—

Figure 1 is an elevation of my improved bag with a portion broken away; Fig. 2 is a vertical section of the same on a larger scale with the central portion removed to shorten the height; Figs. 3 to 13, inclusive, are diagrammatic plan views of the prepared paper in the process of making the container to be inserted in the textile outer bag; and Fig. 14 is a similar view showing the making of a modified form of container embodying my invention.

2 is the textile bag or outer covering, and may be formed of any coarse textile material having strength and cheapness. Instead of using closely woven duck as heretofore, in cement bags, common bagging of hemp or cheap material may be employed; and the weave need not be close, as this outer textile covering is not required to prevent either moisture entering or the materials from dusting through its meshes. This outer textile bag is employed as a supporter for the inner prepared paper container in which the materials are packed, whereby the package as a whole may be roughly handled without physical injury to the container.

The container 3 is formed of a paper sheet 4 folded upon itself to provide a multiple ply bag and impregnated or coated between its plies with a water-proof substance. The general preferred shape of the sheet 4, before being folded, is shown in Fig. 3, and is rectangular except for the small corner 6 which may be cut out; that portion below the dotted line $x-x$, constituting the bottom folds, being slit as at 5 slightly to one side of the vertical lines of folding 7. The inner surfaces of the first two plies 9, 9, may be devoid of water-proofing compound, but all other portions may be coated or impregnated with such a compound, as indicated at 8. In practice, I apply the water-proofing compound to the paper sheet 4 upon one or both sides, preferably leaving the surfaces 9, 9, of the first two opposing plies without water-proofing material so that the interior 13 of the paper container shall not present a surface which, in warm weather, might be more or less sticky; I, however, do not confine myself in this respect.

After the sheet has been prepared as

shown in Fig. 3, it is first folded on the vertical line $y-y$ (Fig. 4); then the bottom flap 10 is turned up to form the bottom and secured against the outer surface of one of the first plies 9 of the sides, the result being what is shown in Fig. 5. The sheet is again folded on the next folding line (Fig. 6), and the bottom flap 10 so provided is folded upward to provide a second ply to the bottom, and said flap is secured to the outer face of the side as shown in Fig. 7. This operation is continued until all of the sheet is folded with the result that a multi-ply paper bag is formed having a reinforced bottom having a greater number of plies than the sides. Where the sides are of three ply, the bottom is of five or six ply, as desired, and likewise, the lower portion of the sides are also of five or six ply, so that the completed bag is very strong and may be lifted or pulled around roughly with load and not be liable to rupture. It will further be observed that by having the slits 5 to one side of the folding lines $y-y$, there is provided a closed corner 11 at every ply, and these closed corners are so formed that it is impossible to rupture them with any reasonable use.

The water-proofing material is preferably such that when applied to the paper it will enable the several plies or folded portions to stick together so as to make a strong and tight bag or container. This material should not be brittle nor sticky at normal temperatures and I have found that an excellent waterproofing material for use of my improved container may be made by mixing pulverized resin, mineral oil and turpentine. While I do not restrict myself as to the proportions of these ingredients, the rosin should be dissolved in the turpentine to form a thick paint, and as the rosin will become dry and brittle when the turpentine evaporates, it is necessary to incorporate with it enough mineral or other non-oxidizing oil or greasy substance which will prevent its becoming brittle and hard. The compound should retain flexible and elastic properties. The most satisfactory material to add is cheap mineral oil.

The oil present is only just sufficient to make the rosin elastic instead of brittle, so that it will not crack. This impervious mixture may be modified in practice and cheapened by additions of pitch or tar, but a purely sticky material could not be employed as it would enter the material put into the bags.

The water-proofing material may be applied to one or both surfaces of the paper sheet before folding or during folding, or the paper may be thoroughly impregnated throughout with the compound before being folded. However, cheapness of construc-

tion is a most important factor as, in most cases, the bags are not returned to the manufacturer or distributor.

Instead of having the slits 5 out of alignment with the folds $y-y$, they may be in the same alignment, as shown in Fig. 14. In this case, however, the extreme corners of the impervious bag should be doubled over when put into the textile covering.

The cement, lime or other material to be packed and shipped is put into the paper bag or container 3 after the same has been assembled in the textile bag 2; said container preferably fits the textile bag snugly and the open end of said compound bag is gathered in and tied. If desired, the paper bag may be tied first and the textile bag tied over it, but I prefer to tie both the bag and container at the same time.

The details of construction may be modified without departing from the spirit of the invention as defined in the claims.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. A container for shipping and storing deliquescent materials, which consists of an impervious multiple-ply bag of paper comprising a sheet of paper coated with a pliable or non-brittle water-proof cementing compound and folded on parallel lines to provide a body having adhering multiple-ply side walls and the lower extensions of the body side plies respectively folded over upon opposite sides of the body to provide a multiple-ply closed bottom, and each of said extensions arranged between the adjacent plies of the sides of the body, the various piles of the body and bottom portions being firmly secured together throughout their entire surfaces and made impervious to moisture by the presence of the water-proof cementing compound and the bag as a whole normally pliable.

2. A water-proof bag or container for packing and transporting deliquescent material, which consists of a bag-like structure formed of a sheet of suitable material coated with a water-proof normally pliable cementing compound and having one edge split at a plurality of points to form a row of separate tabs of shorter length than the length of the bag or container, said coated material being folded on lines transverse to the length of the material to provide a plurality of superposed and adhering plies forming multiple-ply sides, said folds extending longitudinal of the respective tabs and relatively close to one of their edges, the folded tabs of the plies of the two sides folded over alternately to overlap each other and forming a bottom composed of a plurality of adhering plies and closed corners and the respective ends of said tabs extending between

and adhering to adjacent side plies, the whole forming a bag or container in which the entire side-plies and bottom-tabs are all united to form continuous pliable impervious walls; to constitute an impervious adhering multiple-ply structure with multiple-ply corners.

In testimony of which invention, I hereunto set my hand.

MAXIMILIAN SMETANA.

Witnesses:

R. M. HUNTER,

R. M. KELLY.