

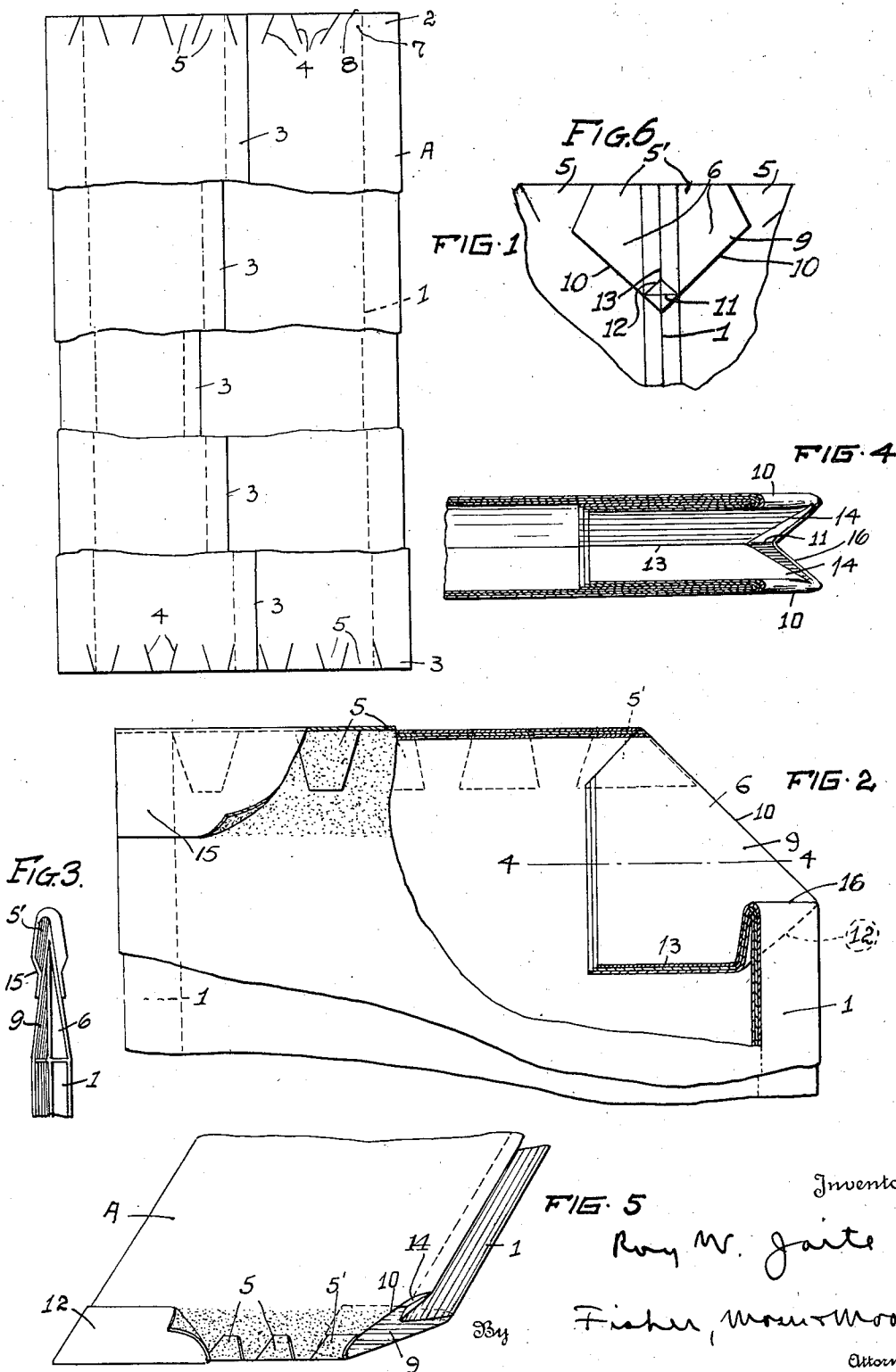
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PAPER BAG

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PAPER BAG

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My invention relates to improvements in paper bags and more particularly to paper bags in which the opposite ends are closed, such for example, as in the so called valve type in which the body of the bag is composed of a multiple or plural number of flat tubes or tubular plies of paper, and provided with a self closing valve in one angular corner. Such bags are usually plicated or formed with pleated folds at their longitudinal edges, and closed at both ends, except for the valve opening in one corner. To close such ends the general practice is to sew the corresponding ends of the plies of paper together, and also to paste a binding strip around the end edges. Each tubular ply of paper also possesses a pasted longitudinal overlapping seam, the ends of which are traversed by stitches and united together and to other overlapping plies in sewing operations.

For practical usages, paper bags of the type referred to above are of substantial size, say approximately fifteen inches wide and twenty six long in the flat. They are used extensively for transporting powdered materials, for example, cement and hold about ninety four pounds net. To carry that weight, these bags must be made of relatively tough paper and embody a sufficient number of tubular plies to protect the goods therein and withstand breakage and rupture, especially when the bags are being filled, and when picked up and handled. Owing to frequent breakage, and loss of contents of such bags, the trade at present demands that such bags shall embody at least five tubular plies of paper of given quality and strength. However different paper and a lesser number of plies of paper would suffice to make an acceptable bag, providing the bag would not tear or burst open especially in the region of the seams at opposite ends thereof, where the perforations resulting from sewing the paper weaken it against stresses, applied in a line coincident with the plane of the paper. This weakening of the paper has been overcome by interlocking the opposite walls of the bag together by means of a number of tongues formed by slitting the opposite ends of the paper tubes on converging lines. These tongues are alternately folded in opposite directions and back upon the opposite walls of the tubes and preferably pasted thereto. Such folding of adjoining tongues in opposite directions and pasting of these tongues to opposite walls of the tube insure a tight, strong perfectly sealed bag, which is less liable to rupture at the ends, than where the customary sewn seam is employed.

A bag of the type described above is generally filled through a valve arranged in one corner thereof, and the walls of the bag at this point are extended somewhat beyond the adjacent edge portions of the bag so that when the valve is folded in, it will extend into the bag some distance. Suitable bag lengths embodying extended wall portions for the valves are preferably cut from a continuous tube. However in cutting the bag lengths in this way a rectangular portion of paper is cut therefrom, and this portion must be discarded. This waste of paper is expensive and its discharge from a tubing machine, which forms the multiply tube and severs it into given bag lengths, materially interferes with proper operation of the machine. My object in general is to eliminate the waste just referred to, and this object is attained by uniting the walls of the bag in sealing union by means of the oppositely folded tongues previously referred to, the slits for forming the tongues being omitted from the valved corner of the tubes over an area approximating the width of two tongues. This relatively wide uncut area serves the purpose of the conventional extension heretofore employed as a valve flap. A further object is to provide a valved bag in which the upper edge of the valve is reenforced to withstand the stress incident to the use of a filling tube extended through the valve and contacting with said edge during filling operations. These and other objects and details of the invention will be described in connection with the accompanying drawing, which forms a part of this specification and in which:

Figure 1 is a side elevation partly broken away of a bag length cut from a plicated tube;

Figure 2 is an enlarged fragmentary side elevation partly broken away of a valved bag embodying my invention;

Figure 3 is an enlarged side view of the bag shown in Figure 2;

Figure 4 is a section on the line 4—4 of Figure 2;

Figure 5 is a fragmentary perspective view of a portion of the bag with the end reinforcement strip partly broken away; and

Figure 6 is an enlarged fragmentary side elevation showing the apex of the gusset fold before it has been tucked inwardly as shown in Figure 2.

Bags of the multiply type disclosed in the drawing are usually manufactured from a series of sheets or strips of paper fed through a tubing machine and creased or folded and then cut transversely to form a multiply tube A having pleats or inwardly extending folds in the lon-

gitudinal edge portions thereof. The sheets are fed into the machine in superposed relation with their parallel edges offset or in stepped relation so that when the sheets are jointly folded to produce a flat plicated tubular body the parallel edge portions of each sheet overlap and form longitudinal seams 3. Paste is also applied to the paper along the longitudinal edge thereof so that the overlapping parts of the seam in each sheet are united together to form the tubes A. As the multi-ply folded sheets are being severed transversely to form the tubular sections or tubes A the opposite ends 2 and 3 of these sections are simultaneously slit, preferably along converging lines 4, to form a number of tongues 5 which thereafter are alternately folded in opposite directions and back upon the opposing walls of the multi-ply tubes A. The tongues 5 are then secured in folded position by pasting, thus tightly and securely closing the ends of the bag. However, before the tongues 5 are folded and pasted it is first necessary to form the valve 6 in a manner presently described.

It will be noted, as best illustrated in Figures 1 and 2, that the plicated corner 7 of the tube sections A which is folded inwardly to provide the filling opening is left uncut, and this uncut area 8 which is equivalent in width to approximately that of two tongues 5, constitutes an extension which serves as a flap for closing the valve opening 9, when the corner of the tube is properly folded. In forming the valve 6, the plicated corner 7 including extension 8 is first opened into substantially rectangular form and is then folded inwardly and downwardly along diagonal lines 10 extending across the corners of the sides of the bag. Following this step, or simultaneously therewith, the side walls of the bag and the extension 8 are pressed inwardly to form the horizontal fold or crease 13 along the bottom of the valve. Thereafter the apex 11 of the gusset fold 1 is tucked inwardly and folded against the inner face of the inwardly folded extension 8, so that the material of the gusset contiguous to diagonal lines 10 and inward of the bag, folds on diagonal lines 12, extending from lines 10 diagonally downward to the inwardly folded horizontally disposed portion 13. The bag is filled by means of a tube (not shown) inserted in the valve opening 9, and it is of course essential to provide for the escape of trapped air. In this connection it will be noted that the manner in which the valve 6 is folded results in upwardly inclined channels 14 being formed at opposite sides of the apex 11 of the gusset fold, through

which the air escapes as the cement, flour or other material is fed into the bag through the filling tube. By tucking the portion or apex 11 inwardly and upwardly, the edge 16 serves to support the filling tube in elevated position relatively to the channels 14.

The first slit or that slit adjacent to the uncut area 8 is preferably at an angle of 45° to the edge of the bag, in order to align the side edge of the first tongue 5' with diagonal fold 10 for stiffening and reinforcing the upper end of the valve. A wide reinforcing binding strip 15 of paper or other suitable material folded around the closed edge of the bag and secured upon both sides of the outer tube by paste or adhesive secures the tongues in their folded position. The end of the binding strip overlying the valve is preferably cut off along the line of and adjacent the diagonal fold 10.

Having thus described my invention,
What I claim is:

1. A valved paper bag comprising a bifurcated tubular body having straight ends slitted on converging lines to form a plurality of locking tongues alternately folded back upon and secured to the opposite side walls of said bag, the valved corner portion of said bag being uncut and the diagonal extending folding line of the valve, forming the edge thereof, extending from the end of the outer slit of the tongue adjacent to said valved corner portion, said outer slit being substantially inclined with respect to the straight edge of said bag to align the edge of the tongue adjacent to said valve with the said outer edge thereof for stiffening and reinforcing the upper portion of said valve.

2. A valved paper bag comprising a gusset folded tubular body closed at opposite ends, one corner of said body having its walls folded inwardly on diagonal lines to form a valve flap and its gusset fold extended from the lower edge of said diagonal folding lines to form inclined diverging passages adjacent to said flap and extended outwardly and upwardly from the bottom portion thereof.

3. In a paper bag closed at opposite ends, a valve formed in one corner of said bag, said valve including a valve flap embodying a tucked in portion arranged parallel to and folded back upon the inner wall of the gusset fold of said corner to form inclined diverging passages extended outwardly and upwardly from the bottom of the end portion of said valve flap.

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