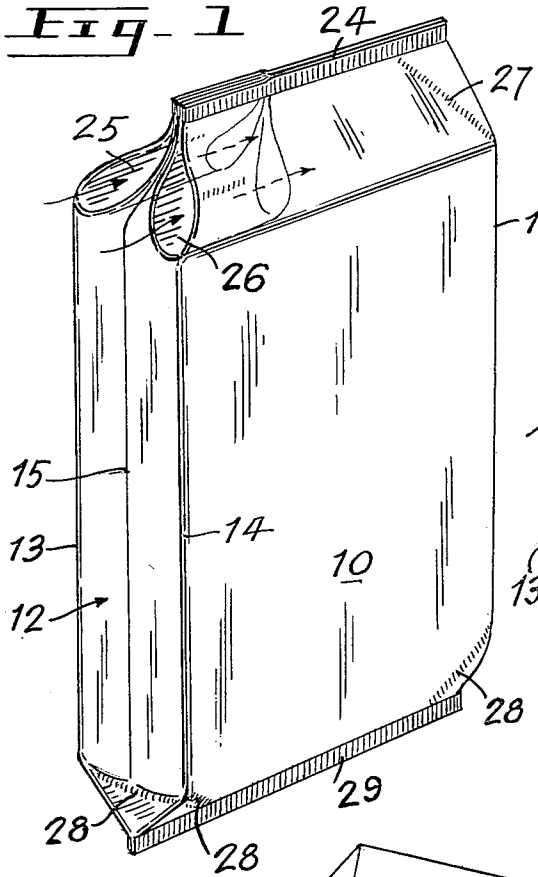
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DOUBLE VALVE BAG

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Fig. 1



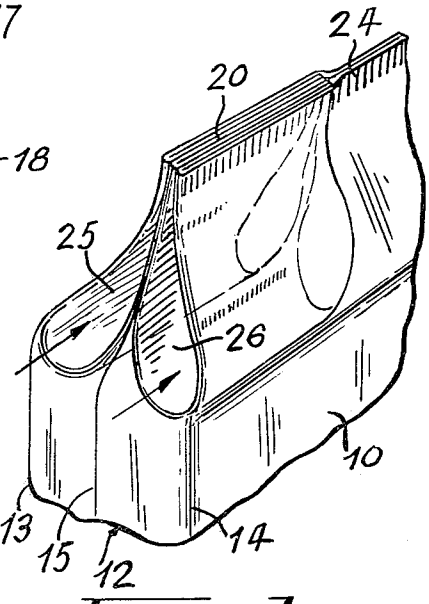


Fig. 2

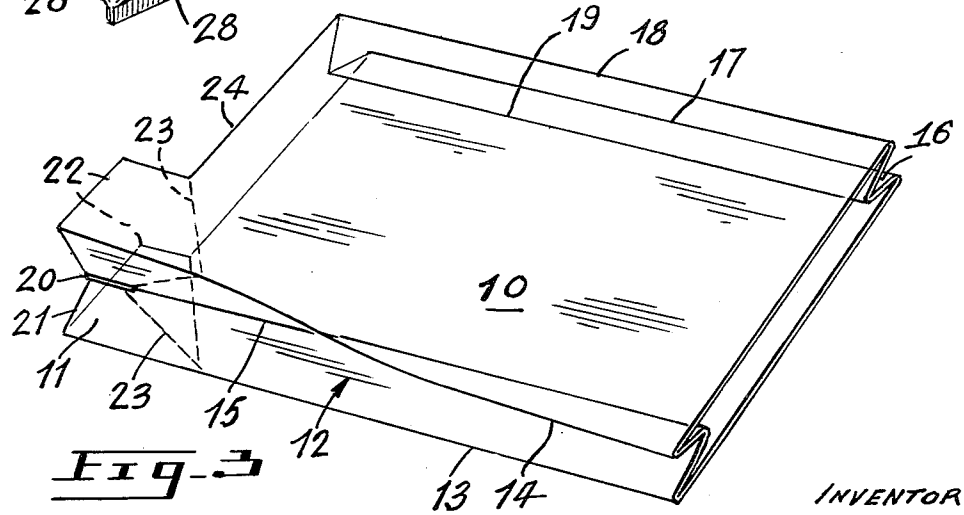


Fig. 3

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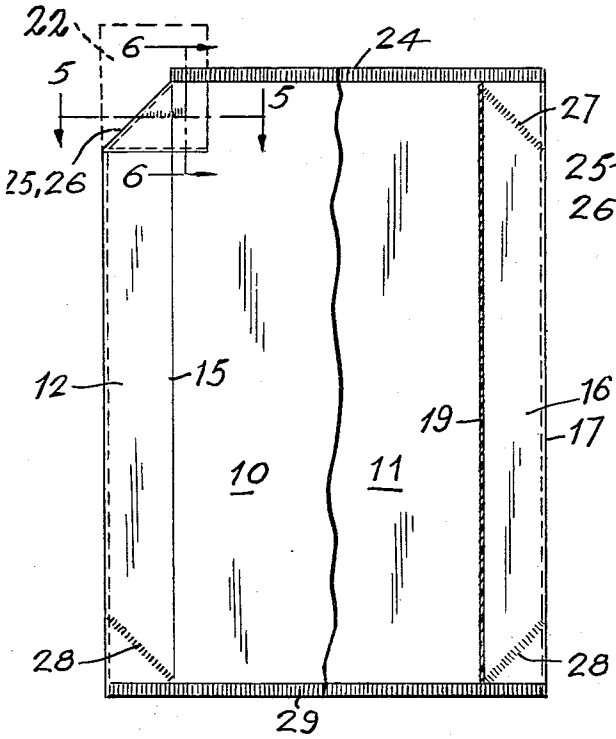


Fig. 4

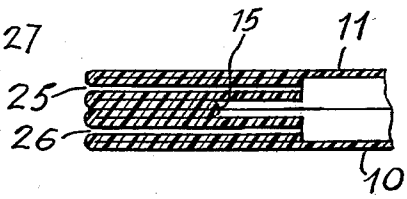


Fig. 5

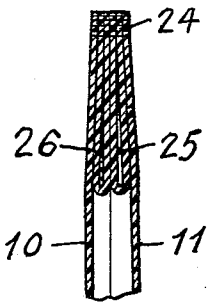


Fig. 6

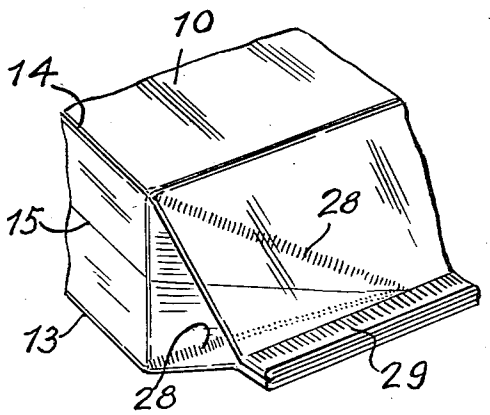


Fig. 8

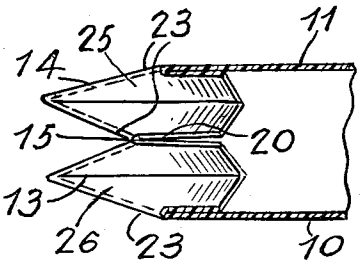


Fig. 7

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3,050,235

DOUBLE VALVE BAG

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Filed Oct. 6, 1960, Ser. No. 60,904
Claims priority, application Canada Sept. 1, 1960
4 Claims. (Cl. 229—62.5)

This invention relates to plastic bags and more particularly to plastic bags having two sleeved filling openings at one corner thereof called valves.

The use of plastic bags in packing is growing every day. The applications are numerous particularly in bagging materials calling for high moisture protection or chemical resistance. They are employed especially with finely divided granular pulverized and powdery material such as ammonium nitrite, urea, polyethylene resin granule, dry acids, cement, etc. Plastic bags are also sought after for their effective striking appearance.

Problems connected with the use of plastic bags however, especially in heavy-duty shipping have deterred the use thereof, one of the drawbacks being bag failure. Other disadvantages are the handling problems stemming from the slipperiness of the material and also some powdery materials rendering the sealing problem acute.

It is therefore, a primary object of this invention to overcome the short-comings and disadvantages of plastic bags heretofore in use. Another object is to provide a plastic bag having failure proof corners adapted for heavy-duty shipping. A further object is to provide a plastic bag having corners which are extra strong, simple in construction, easy to manufacture and adapted for heavy-duty shipping. A still further object consists in having the plastic bags entirely produced in the bag making factory which eliminates all further heat-sealing or closing operation. A particular object of this invention is to provide a plastic bag having two valves at one corner thereof, which are closed by the inside pressure of the material when the bags are turned upside down. These and other objects and advantages will become apparent from the following description of the invention.

Referring now to the drawings:

FIGURE 1 is a perspective view of a bag made in accordance with the present invention;

FIGURE 2 is a fragmentary view showing the two valves of the bag;

FIGURE 3 is a perspective view illustrating a cutting pattern of the gussetted tubular plastic material used to make the bag;

FIGURE 4 is a side elevational view with parts broken away showing the heat-sealing point of the bag;

FIGURE 5 is a diagrammatical cross-sectional view along line 5—5 of FIGURE 4;

FIGURE 6 is a diagrammatical cross-sectional view along line 6—6 of FIGURE 4;

FIGURE 7 is a fragmentary cross-sectional top view of the folding of the two sleeves to form the valves;

FIGURE 8 is a fragmentary view of the construction of a bottom corner.

Referring now to the various figures wherein like parts will be referred to by the same reference characters, **10** is a gussetted flat tube of suitable plastic material having at one corner thereof extension **11**.

The gusset **12** is formed by two outer creases of folds **13**, **14** and one inner crease **15**, similarly gusset **16** is formed by outer creases **17** and **18** and inner crease **19**. The term gusset is herein used to mean the inwardly directed area of the plastic tube divided in two portions both facing each other, which is caused by creasing the plastic tube at lines **13**, **14** and **15**, and **17**, **18** and **19**, as shown in FIGURES 1, 3 and 4. To form valves, the extension **11** is vertically cut **20** at line of crease **15** as shown in FIGURE 3; the two resulting parts **21** and **22** of the extension **11** hereinafter referred to as sleeves **21** and **22** are then folded inside the bag along lines of fold **23** such that they project inwardly thereof parallel to the top **24** as shown in FIGURES 1, 2 and 4. Two valves are thus obtained **25** and **26**. At the three non-valved corners of the bag the two portions facing each other formed by the divided area of the gusset are respectively diagonally heat-sealed at approximately 45° to the externally adjacent side of the bag as indicated by reference characters **27** at the top **24** and **28** at the bottom **29** of the bag. The top **24** and bottom **29** of the tubular material are then heat-sealed in their entire widths to form the bag. In this manner no material contained in the bag can penetrate into the triangular shaped section of the corners at the three non-valved corners.

The two sleeves **21** and **22** which form the valves **25** and **26** are in a rectangular form as shown in the various figures of the drawings. However, in order to provide the plastic bag with a more secure closure, the two sleeves **21** and **22** or one of them can be in a trapezium form, which is disclosed and illustrated in applicant's copending application Canadian Serial No. 798,639.

For filling purposes a filling tube or spout of a packing machine is inserted into one of the valves and the material is fed into the bag while the air which is trapped in the bag and forced into it escapes through the other valve, which permits equalizing the inside and outside pressures. This makes it possible to obtain a maximum load in the bag. If desired, a tube connected with a slight vacuum source can be inserted through the valve which is not used for filling. It goes without saying, that in order to shorten the filling time both valves can be used simultaneously for filling the bag.

After being filled the bag is dropped upside down and automatically the inside pressure of the contents forces the two sleeves **21** and **22** of the extension **11** against the side and the extremity **24** of the bag which is now the bottom, thereby closing the valves.

One would think that the contents of the bag would come out upon tipping the bag, however, such is not the case. In effect, the plastic film employed to make these bags has an advantageous characteristic; then when it is folded it does not tend to take its original position or to spring back; the creases formed are stable. Moreover, in most cases the two sleeves **21** and **22** are nicely folded. However, if it is desired to obtain a more uniform folding of the sleeves **21** and **22** the outer sides of the two sleeves **21** and **22** are longitudinally heat-sealed about their middle to the adjacent side of the bag as shown in FIGURES 1, 2 and 4.

There is no supplemental sheet sleeve or valve lining needed to secure the closure of the valve. The construction of the corners of the bag made in accordance with the present invention remarkably improves the appearance of the bag by forming well shaped rectangular corners after the bag is filled as shown in FIGURE 4, this greatly reinforces the strength of the corners and also provides the bag with outside empty pockets at each non-valved corner which furnishes an excellent means for lifting and carrying purposes. The closed triangular shaped sections located at each non-valved corner are considered as an important feature of the invention.

The invention also contemplates the printing, if so desired, of the flat plastic tube at desirable areas before filling the bag.

Any heat-sealable plastic material can be employed to form the bag of this invention the only limitation being the heaviness and special chemical requirements of the material for which the bag is designed.

It is to be understood that various modifications could

be made in the above construction shown and described without departing from the scope of the invention.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A bag formed from a flattened tube of heat-sealable thermoplastic material, having a single gusset at each side, said tube being heat sealed at each end, having an integral extension in one corner, said extension comprising the section of the tube forming one gusset and the adjacent walls of the bag, each half of said extension comprising one side of said gusset and the adjacent wall of the bag being independently folded inwardly in such a manner that the line formed by the side of the gusset and the adjacent wall of the bag will be rotated through an angle of substantially 90°, forming two adjacent valve filling inlets.

2. A bag as claimed in claim 1 in which the two walls of at least two of the non-valved corners are heat-sealed at approximately 45°.

3. A bag as claimed in claim 1 wherein the two outer-walls of said valve are heat-sealed to the adjacent walls of said bag.

4. A bag as claimed in claim 1 in which said thermoplastic material is polyethylene having a specific gravity of .9125 to .975.

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