

[54] **PLASTIC BAG HAVING ELONGATE APERTURES ANGULARLY DISPOSED**

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[57] **ABSTRACT**

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[51] Int. Cl..... **B65d 33/00, B65d 33/14**

[58] Field of Search..... 229/53, 51 TS; 206/57 A, 206/DIG. 8, 57 R

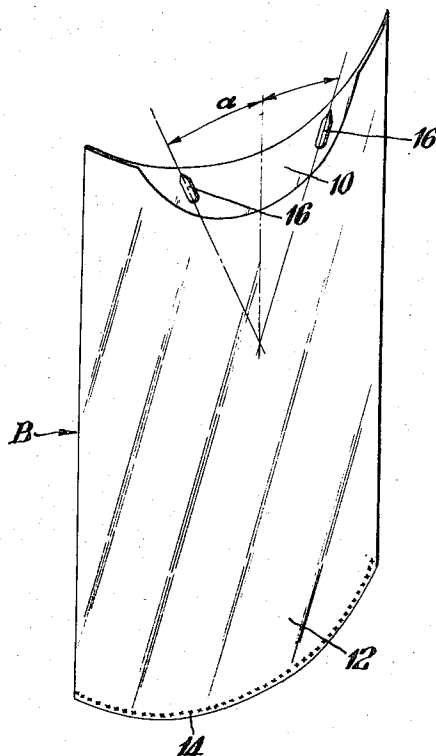
The rear wall of a bag for packaging food, particularly meat, which is remote from the closed end of the bag is provided with elongated apertures angularly disposed with respect to the longitudinal axis of the bag and to each other for mounting a stack of bags on a wicket.

[56] **References Cited**

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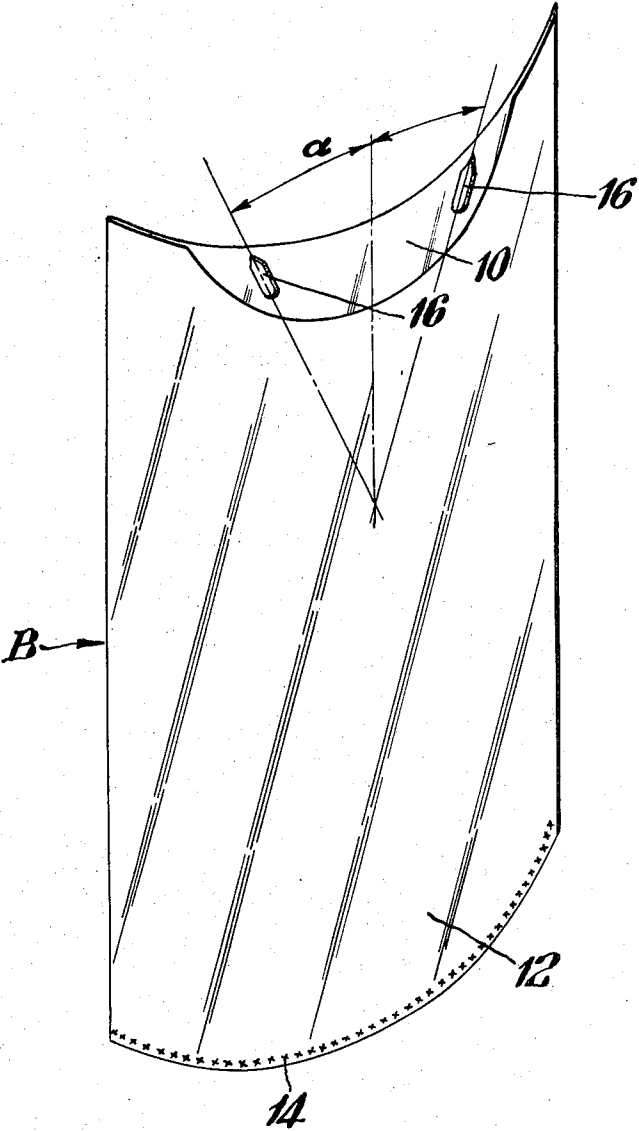
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8 Claims, 1 Drawing Figure



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PLASTIC BAG HAVING ELONGATE APERTURES ANGULARLY DISPOSED

The invention relates to a flexible plastic bag for packaging food, particularly processed or uncooked meat, and refers more particularly to a bag having a closed end and an open end provided with a plurality of apertures to accommodate the legs of a wicket or similar device for holding a stack of bags.

The food packaging industry is moving rapidly to more use of bags for perishable food items and particularly so in the area of meat products. Processed meats, such as bolognas, meat rolls, smoked hams and other familiar items and fresh meats, including poultry and fish are appearing more and more frequently as pre-packaged items. Although many such prepackaged food items are prepared by wrapping the food product, sometimes on a more or less rigid support, in plastic film, the use of bags to contain the product offers many potential advantages and is growing.

While it is of course very simple to place an object in a bag, it is far more difficult to produce efficiently, economically and with full regard to sanitation and health principles packaged food items on a rapid, repetitive, commercial scale. Materials suitable for use in contact with food are relatively expensive. Meat items (except of course in the case of processed items such as bolognas) are far from uniform in shape. Despite mechanization of many of the operations in producing large numbers of food packages, manual handling is necessary.

In attacking such problems, the art has devised ingenious machines for handling bags in repetitive cycles, machines for loading the bags, devices for arraying the bags in good order for handling, and an impressive assortment of support apparatus such as conveyors, and bag closing and tying machines.

The heart of the bagging system, however, is the bag itself. A number of bag structures have been shown in the patent literature. Specific reference is made to U.S. Pat. Nos. 3,441,198; 3,317,037; 3,352,411; 3,508,379; 3,156,273; and to Canadian Pat. No. 851,553. Bags have been produced from tubular film by sealing the tube at one end and from folded film by sealing at the sides, and others have been made by sealing two superimposed films at their edges. In some bags, the front and rear walls are the same length. These are called "flush cut" bags. In others, the front wall is shorter than the rear wall. These are called "lipped" bags. In some tubular bags, the ends are arcuate, and in some the front wall has a cut-out portion less than the flat width of the bag. Regardless of the bag configuration and size, it is conventional to provide at the open end of the bags one or more apertures. Through these apertures the legs or posts of a holding device such as a wicket are passed to provide a stack of bags that may be handled as a unit. Usually two such apertures are provided to prevent side-to-side dislocation of the bags during handling and the insertion of an item to be packaged. Examples of such construction are shown for instance in U. S. Pat. Nos. 3,317,037 and 3,508,379 and Canadian Pat. No. 851,553 referred to above.

When a wicketed stack of bags is put to use, the stack is placed on a support, and an article to be packaged is presented to the top unit bag in the stack which is arranged with the bags in a generally horizontal array. When the article is in the bag, force directed against the inside bottom of the bag by the article separates the

bag from the stack by tearing the apertures through which the wicket posts pass. Usually the bags are opened by an air blast, and as each bag is filled and removed from the stack the next one is opened.

For rapid, repetitive operation it is important that bags release quickly and tear evenly from the wicket. When food items are being packaged, it is particularly important that no fragments of the bag be dislodged and blown into the bag by the air blast. The nature of films used to fabricate such bags frequently is such that it is difficult to attain these results. For instance some bags are of brittle film which tends to shatter, and some are of tough film which is difficult to tear.

For food use one popular film is biaxially oriented polyvinylidene chloride. Another is biaxially oriented polyethylene. Bags made from these materials are tough and may be torn easily from wickets. However, improper tearing technique or improperly formed apertures may cause fragments of film to be left at the wicket when a bag is torn from a stack. Furthermore bags made of such films may shrink somewhat when exposed to moderately elevated temperatures for example during summer shipping and storage, and such shrinkage may cause binding of the bags on the wicket posts and consequent difficulties in removal of the bags from the wicket.

The principal object of the invention is to provide a bag free of the aforementioned disadvantages. More specifically, an object of the invention is the provision of a flexible, plastic bag adapted to use in the bagging of food products on rapid, repetitive apparatus which bag is provided with apertures permitting support of the bag on a wicket with easy clean removal therefrom.

The sole FIGURE of the drawing is an isometric view of a bag embodying the invention by means of which these objects are attained.

The bag of the invention has front and rear walls of flexible plastic film appropriately joined. The film may be tubular, in which case the bottom end is sealed. It may be a folded sheet with side seals, or the bag may be formed of two films sealed together. In any case at the end of the bag remote from the closed end apertures are provided to permit the reception of posts of a wicket. As will be described in more detail below these apertures are elongate and arranged at an angle to each other and to the longitudinal axis of the bag. With respect to the bottom of the bag the apertures may be convergent or divergent. The bag may be of the flush-cut type in which case the apertures are provided in front and rear walls. Or, and preferably this is so, the front wall of the bag has a cut out portion at its open end, and in this case the apertures are in the rear wall of the bag.

Referring to the drawing, a tubular bag B is shown having a rear wall 10 and a front wall 12 joined at one end by a seal to form an arcuate closed end 14. The end of the rear wall 10 remote from the closed end 14 is arcuate and generally parallel to the closed end 14. Generally centrally of the flat width of the front wall 12, an arcuate portion of a radius shorter than the radius of the arcuate end 14, and the end of the rear wall 10 is cut out and removed. In the portion of the rear wall 10 exposed by the cut out portion of the front wall 12 apertures 16 are provided for positioning the bag B on a post or wicket not shown. As seen in the drawing the apertures 16 are elongated, and the ends thereof nearer

the top end of the bag are pointed having a generally vee shape while the ends nearer the bottom of the bag are rounded. The apertures 16 are disposed at an angle α with respect to the longitudinal axis of the bag.

The bag of the invention is made of any flexible plastic material. Of course for use in packaging food, the bag must be made of an approved material. Seals in the bag may be made in any way, heat sealing being convenient, economical, and preferred. For packaging meats a preferred material is polyvinylidene chloride. Other suitable materials are: polyolefins, e.g., polyethylene, or polypropylene; nylon; polyethylene terephthalate; polystyrene; and copolymers of those listed. The bag may also be made of a laminate of the type used for food packaging.

The lipped arcuate end bag shown in the drawing offers many advantages. Only the rear wall is retained by the post or wicket legs when bags of this type are stacked on a post or wicket, making for easy removal by hand or by machine. The arcuate closed end adapts the bag to use for items of irregular shape and makes possible close conformity between the item and the bag.

The angle α at which the apertures in the bag of the invention are disposed with respect to the central longitudinal axis of the bag B is about 10° to 15°. A preferred angle is about 15°. The width of the apertures depends to some extent upon the diameter of the wire from which the wicket is formed. Conveniently the width of the aperture is about twice the diameter of the wires; with a wire of 2 mm. diameter, aperture width of 4 to 4.5 mm. is satisfactory. The length of the apertures is about two to three times their width. Thus, for a 4 to 4.5 mm. width a length of about 8 to 13 mm. is satisfactory. The apertures can be made in any of the ways known to the art of making apertures in plastic film, for instance by punching or melting out the portions where apertures are desired.

Bags made in accordance with the invention have been extensively tested on bagging machines in which they have been mounted on wickets and opened by an air stream. Products to be bagged have been inserted

in individual bags and the bags removed forceably from the wicket by the insertion of the products. Such tests have indicated that the bags met the objectives of the invention in that the bags did not bind on the wicket and were readily removed. The apertures tore cleanly with little, if any evidence of bits of film entering the bags.

What is claimed is:

1. A bag formed of flexible thermoplastic film adapted to being mounted on a wicket and having a front wall; a rear wall; and a closed end, at least said rear wall having a plurality of apertures therein for accommodation of the legs of a wicket at the end remote from said closed end, said apertures being elongate and their longitudinal axes being arranged at an acute angle to each other and to the longitudinal axis of the bag.
2. A bag as defined by claim 1 in which said film is a flattened tube and said closed end has a seal between said front and rear walls.
3. A bag as defined by claim 2 in which the longitudinal axes of said apertures are divergent with respect to said closed end and define an angle with the longitudinal axis of said bag of about 10° to 25°.
4. A bag as defined by claim 2 in which the longitudinal axes of said apertures are convergent with respect to said closed end and define an angle with the longitudinal axis of said bag of about 10° to 25°.
5. A bag as defined by claim 2 in which the extremities of said apertures nearer said remote end of said bag are generally vee-shaped, the apices thereof being directed away from said closed end of said bag.
6. A bag as defined by claim 5 in which the length of said apertures is about two to three times their width.
7. A bag as defined by claim 6 in which said closed end is arcuate.
8. A bag as defined by claim 7 in which said angle is about 15°.

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