

[54] **FOLDABLE SUPPORT FOR LIMP PLASTIC BAGS**

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[51] Int. Cl. **B65b 67/12**

[58] Field of Search 248/97, 99, 98, 152, 174;
211/42, 43; 108/132; 229/51 TS

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[57] **ABSTRACT**

A unitary elongated strip of thermoplastic material, for example of polypropylene is formed with a pair of living hinges separating the strip into a central base portion and a pair of upstanding portions; the strip is reinforced by means of angles, ribs, or the like, or of sufficient thickness to be stable when erected and support a small polyethylene bag having its mouth folded over the edges of the support sections; interengaging latches are provided to maintain the supports upright and extended away from the base; when swung over the living hinges, the stiffening ribs, angles or material thicknesses are so arranged that they will fit into each other to enable flat folding of the frame.

16 Claims, 15 Drawing Figures

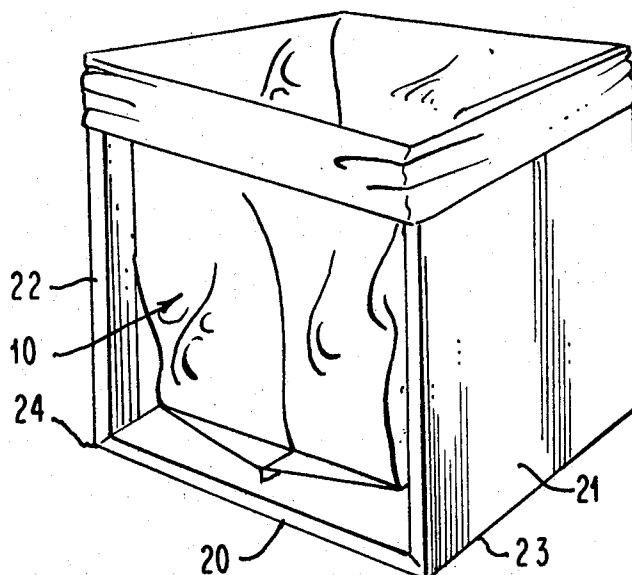


FIG. 1

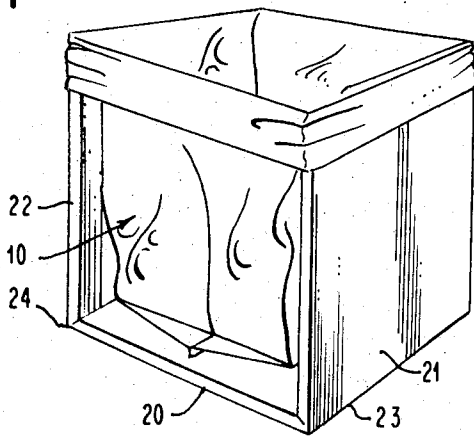


FIG. 2

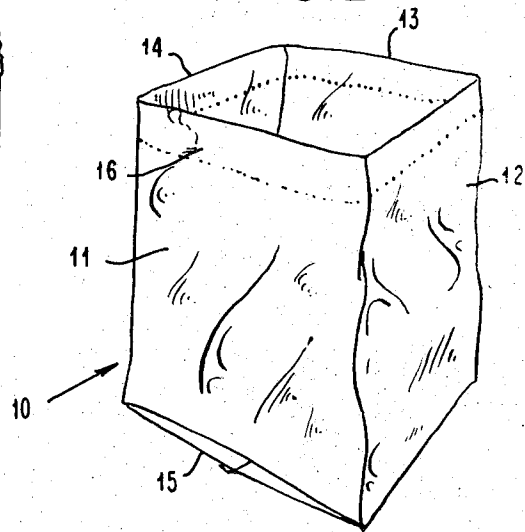
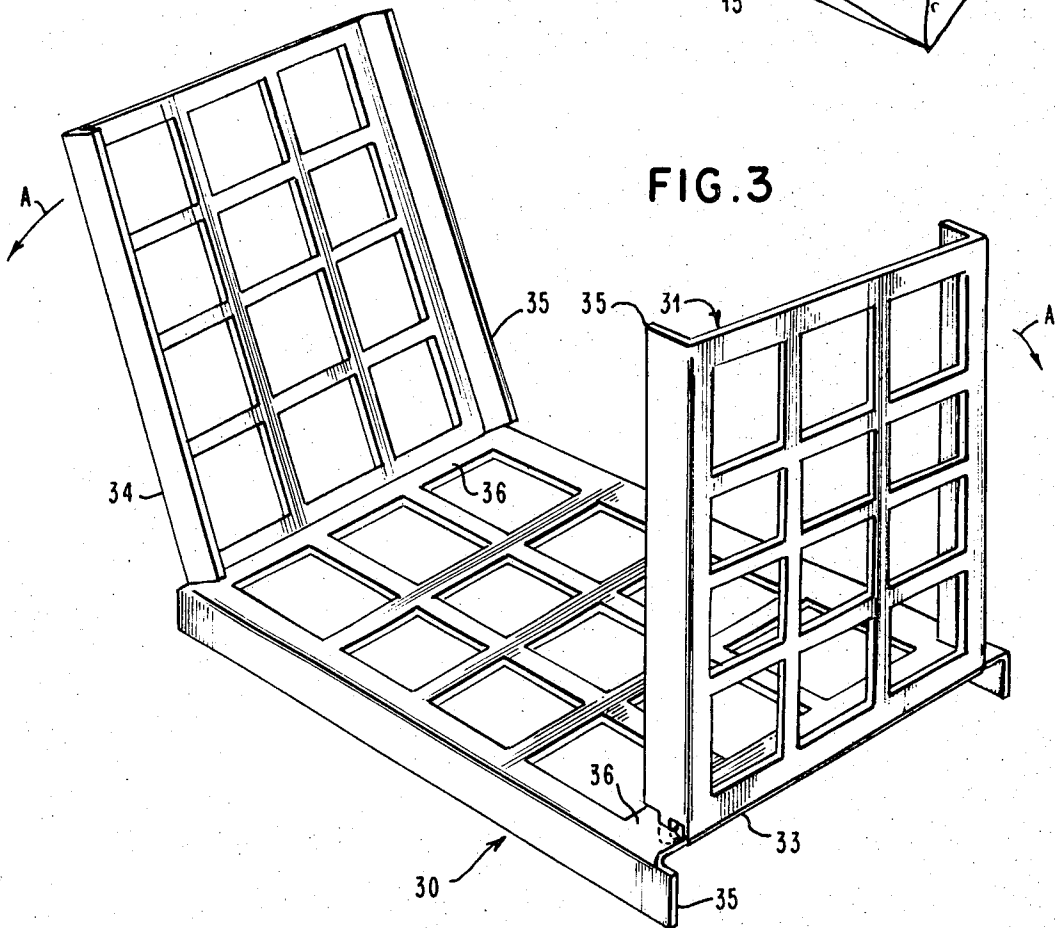


FIG. 3



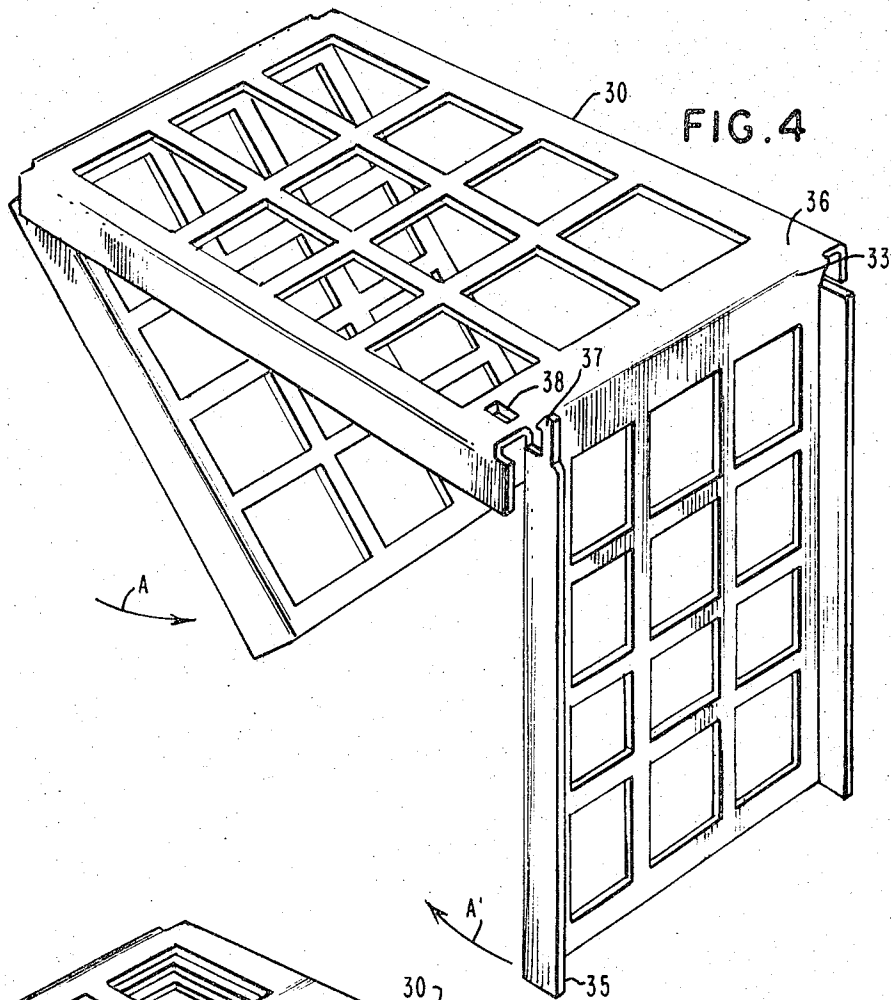


FIG. 5

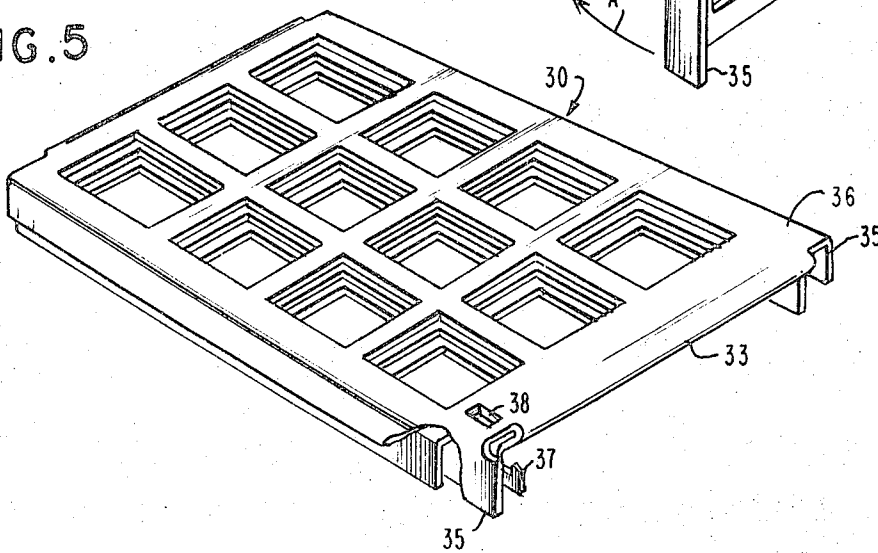


FIG.6

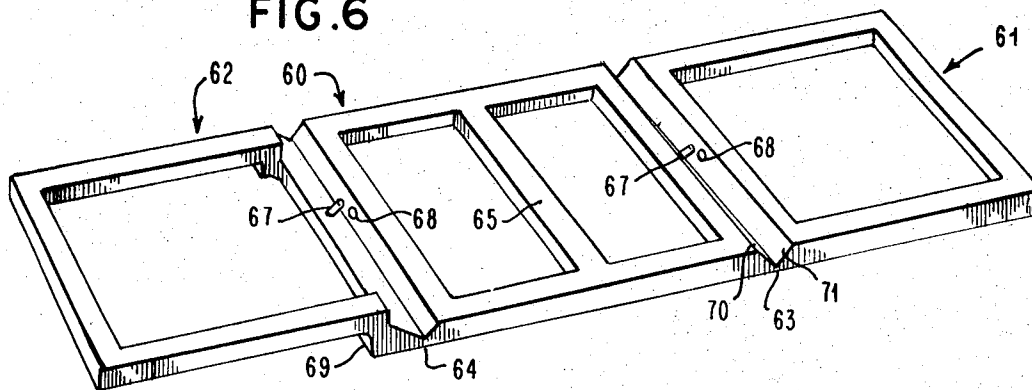


FIG.7

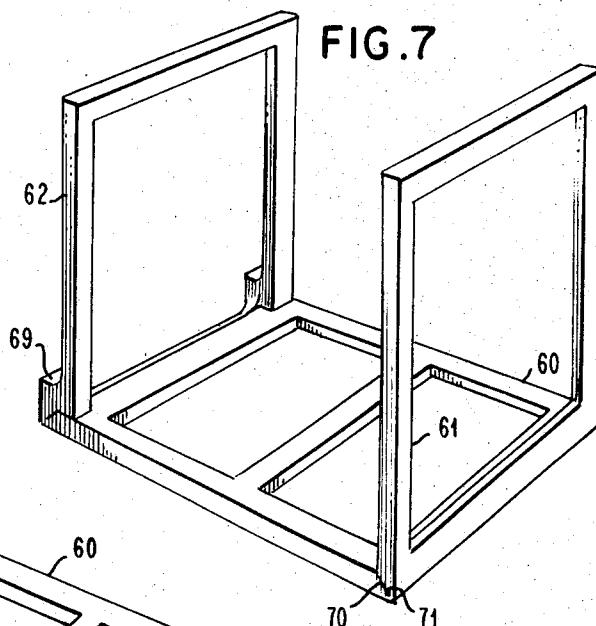


FIG.9

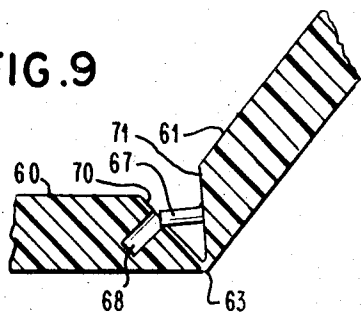


FIG. 8

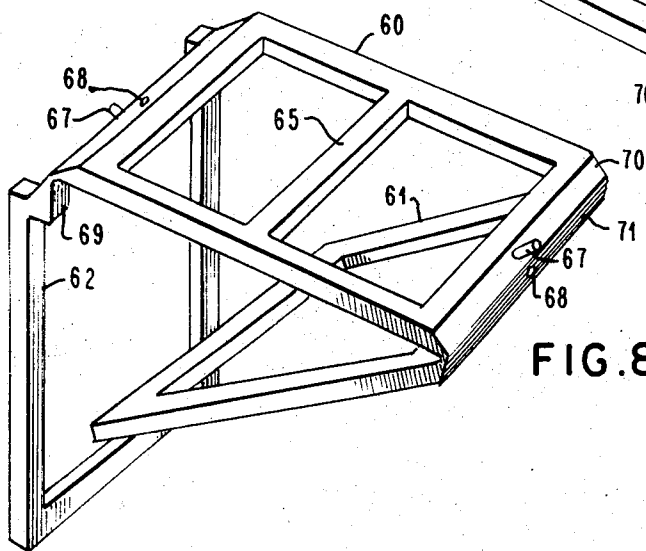


FIG. 10

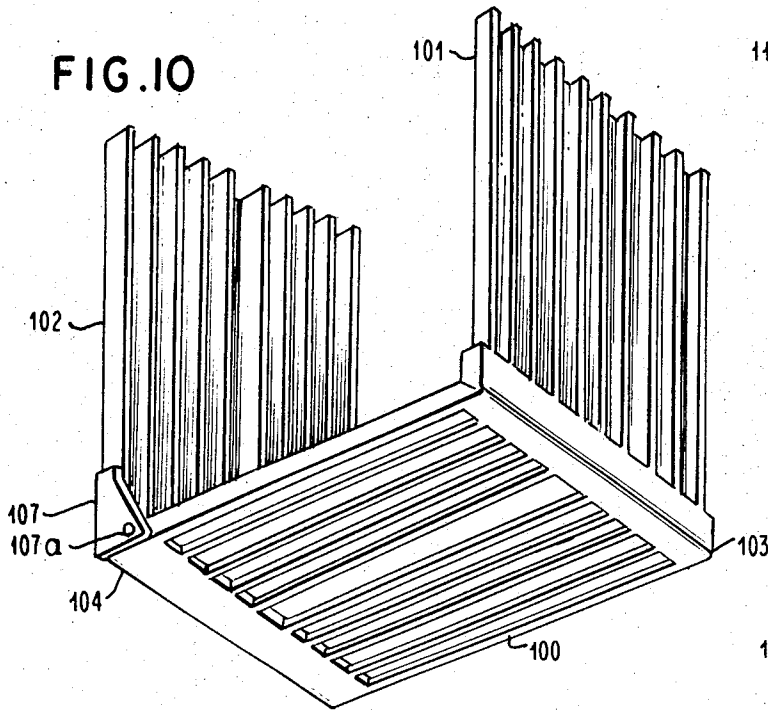


FIG. 12

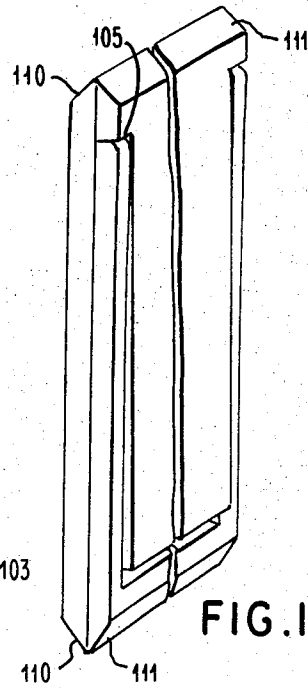
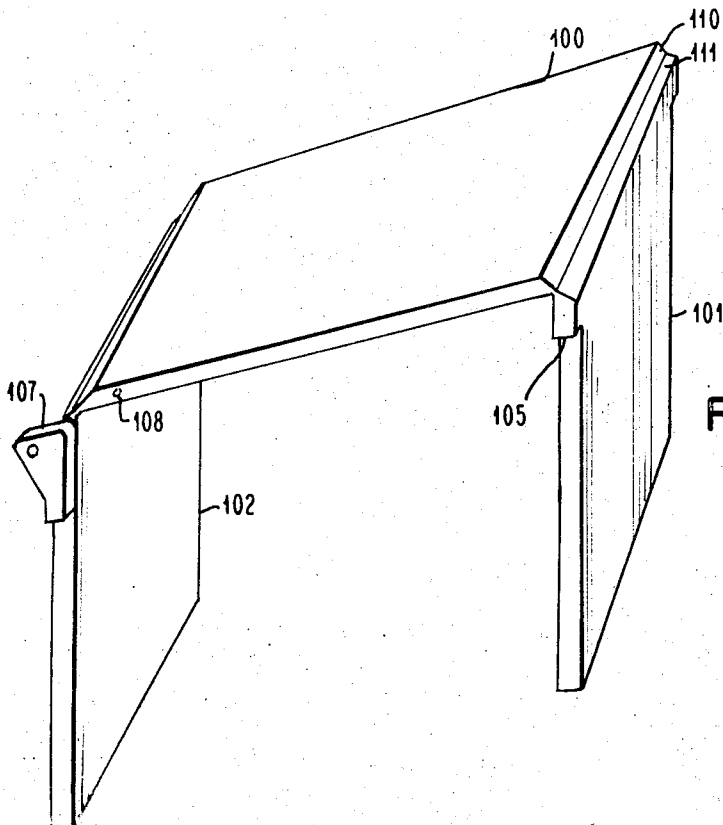
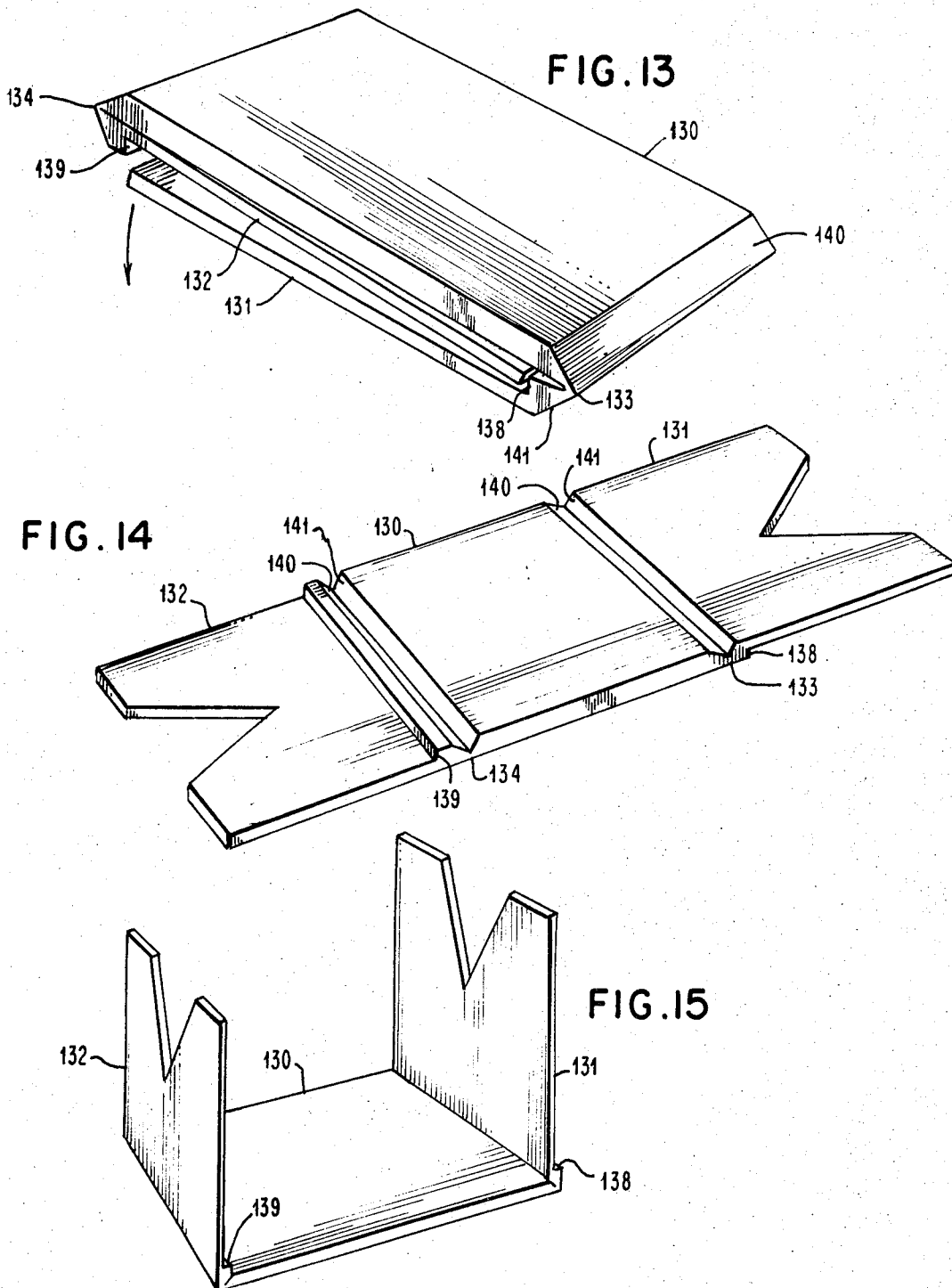


FIG. 11





FOLDABLE SUPPORT FOR LIMP PLASTIC BAGS

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to support stands for disposable trash and garbage bags, and particularly for trash and garbage bags of sufficiently small size so that the entire unit can be set on a kitchen table, used with small disposable bags for small amounts of kitchen scraps which, together with the bag, is then discarded; the stand being so constructed that it can readily be folded in flat form for easy storage.

Plastic bags are not self-supporting and will not stand up, straight, and remain open. When paper bags are used for disposal of kitchen scraps, difficulties often arise since paper becomes soggy, greasy, and loses all strength when wet. Plastic bags, and particularly thin polyethylene plastic bags having a wall thickness in the order of a mil, or so, have the advantage that they are sanitary, waterproof, impervious to grease, and inexpensive. In order to maintain the bags open, however, to enable disposal therein of trash, kitchen garbage and the like, they must be maintained by a stand since they are not self-erecting.

It is an object of the present invention to provide an inexpensive stand which can be made of plastic material which securely holds disposable trash and garbage bags in open, erected position, while supporting the weight thereof.

SUMMARY OF THE INVENTION

Briefly, a unitary elongated strip of thermoplastic material, such as polypropylene is provided and subdivided by a pair of living hinges into a central or base portion, and a pair of support portions which are so arranged that they can be folded away from the base portion and erected to extend at about 90° therefrom. A stop is provided to limit the unfolding swinging of the support portions so that they will stand, erected. Preferably latch means hold the support portion in extended position at least for a sufficiently long period of time to permit placing a limp plastic bag, as previously referred to, with its mouth open over the projecting edges of the support portions. The support portions will then, at two sides confine the sides of the plastic bag to prevent it from bulging out and provide for easy removal; the base portion will support the plastic bag.

In accordance with a preferred embodiment, the plastic bag is of the type which has a tear-off strip around the mouth thereof so that, prior to removal of the filled bag, the strip can be torn off and used as a closing strip directly for the filled bag to provide for sanitary disposal of the contents.

BRIEF DESCRIPTION OF THE DRAWINGS

Advantages of the invention will become apparent to those skilled in the art from the following description considered in conjunction with the drawings wherein:

FIG. 1 is a generally perspective view of the structure of the present invention with a bag therein;

FIG. 2 is a perspective view of a bag prior to placement on the structure;

FIG. 3 is a view of the structure having one support portion erected, and the other in the process of being erected;

FIG. 4 illustrates a step in the folding of the structure and, in detail, a latch;

FIG. 5 illustrates the support of FIG. 3 in folded form, in perspective view;

FIG. 6 is a perspective view of an unfolded flat alternative embodiment of the invention and formed, generally, as a frame;

FIG. 7 is a perspective view of the frame of FIG. 6, erected;

FIG. 8 shows the folding of the frame of FIG. 6;

FIG. 9 is a cross-sectional detail of another embodiment of a latch member;

FIG. 10 is a perspective view of a different embodiment of the present invention showing a ribbed support;

FIG. 11 is a perspective top view showing a step in the folding of the support of FIG. 10, with a different form of latch;

FIG. 12 illustrates the frame of FIG. 10, completely folded;

FIG. 13 illustrates a different embodiment of the support, in folded condition;

FIG. 14 is a perspective view of the support of FIG. 13, lying flat;

and FIG. 15 is a perspective view of the support of FIG. 14, shown erected.

DETAILED DESCRIPTION

The disposable bag for use in the frame is made, for example, of polyethylene or similar plastic of about one mil wall thickness and has four side walls 11, 12, 13, 14 and a bottom 15. The upper ends of the side walls are formed with a tear line 16 which preferably extends circumferentially around the bag. After the bag is filled, the top portion of the walls can be severed at the tear line 16 and the resulting strip, either looped or torn in half, can be used to tie the bag together for sanitary disposal.

Polyethylene or plastic bags are usually limp and will not stay erected in the position shown in FIG. 2 without an external support. The present invention relates to such a support, and to the combination bag and support. It consists, essentially, of a base 20 and a pair of support sections 21, 22. The base and the support sections are made of a unitary piece of plastic material, for example polypropylene, which are interconnected by thin flexible sections commonly referred to as "living hinges." Two such living hinges 23, 24 interconnect the support sections 21, 22 with the base 20.

The frame is so arranged that it can be folded flat (see FIGS. 5 or 12) or erected, by folding the side walls 21, 22 about the living hinges 23, 24 so that the side walls will lie against the base and against each other. When erected, the bag 10 is placed on the base 20, the side walls 12, 14 of the bag are folded over the support sections 21, 22 of the stand, and pulled downwardly so that the tear line 16 will preferably be below the top edge of the side walls 21, 22 of the support. Removal, after filling, is simple since the contents of the bag are supported on the base, and the side walls 21, 22 prevent bulging outwardly of the contents which might interfere with slipping the bag out of the support frame.

Embodiment of FIGS. 3-5 The side walls 31, 32 are hinged by means of living hinges 33, 34 to base 30. Both side walls and base are formed of thin sheets of

polypropylene, with angled-off sides as seen, for example, at 35 to provide stiffness. The width of side wall 31 is less than that of side wall 32, and the width of side wall 32 is less than that of base 30 so that, when the side walls are folded in the direction of arrows A, A' into the position seen in FIG. 4, the side walls will fold flat against each other and the angled edges will not interfere. The entire frame, folded flat, is seen in FIG. 5.

The living hinges 33, 34 permit folding about an angle of 270°, since the bottom edge of angle 35 of the side walls is arranged to bear against a strip of material 36 to limit any inward swinging of the side walls beyond a substantially perpendicular direction to the base. Due to the flexibility of the material used, a bag can readily be stretched over the free edges of the upstanding side wall support sections.

Living hinges of polypropylene do not retain the position into which the two portions have been moved, since they tend to return to an unstressed position. In order to keep the side walls, supporting the sides of the bag in erected position when the bag is to be inserted, a latch is provided which is best seen in FIGS. 4 and 5. One of the angled extensions 35 has an extending tab 37 formed with a small hook which engages into a hole 38. Upon placing the support section 32 in the position shown in FIG. 3, the tab 37 will resiliently deflect and the hooked end will hook through the hole 38. Other latch arrangements can be used and will be described in connection with the other embodiments, it being understood that any one of the embodiments of the support can utilize any suitable latching arrangement. In a preferred form, both support sections have latches to hold them erect for convenience of placing a bag therein.

The frame of FIG. 3 is formed of an open lattice, which should have mesh openings sufficiently small so that, under ordinary household use, the bag will not substantially bulge between the openings provided so that the bulging material will interfere with ready, upright removal of the bag from the frame. Suitable sizes for thin polyethylene bags would be openings in the order of about 4 centimeter-square, which is sufficiently small to prevent undesirable bulges and yet does not waste material. The height of the side walls can be in the order of about 17 cm, with a width of about 12 cm; the base itself would be in the same order as the height of the side walls. The mouth of the erected bag will then have a rectangular opening which has been found to be particularly convenient in use and which, nevertheless, permits the frame to be folded (FIG. 5) flat and have an outline convenient for packaging.

Embodiment of FIGS. 6-8: The base 60 is formed as a frame, to which two frame-like upstanding support sections 61, 62 are attached by living hinges 63, 64. The total weight of material of the support of FIGS. 6-8 is low, although the frame sections forming the base, as well as the support sections are of sufficiently thick material to be self-supporting when erected (FIG. 7). In order to provide for flat folding of the support sections against each other, the normally upstanding support section 62 is offset adjacent the base by an amount at least equal to the thickness of the frame members of the opposite support section 61, as seen at 69. Thus, when the support sections are folded against the base, the offset will provide enough room for flat-folding of

both support sections against each other (see FIG. 8). For stiffness, the base has a transverse member 65; similar stiffening members may be provided in upstanding frames 61, 62, which may additionally have a thin, non-supporting mesh of plastic material, similar to the side walls illustrated in connection with FIGS. 3-5 to prevent bulging of a bag inserted in the frames forming the upstanding members 61, 62. The living hinges 63, 64 can fold about an angle of 270 degrees. In one position, that is approaching the folded flat position (see FIG. 8), the frames are flat against the base, or each other, respectively. When erected, they have been folded over 270 degrees and are prevented from further folding by a pair of angled surfaces 70, 71 formed at matching sides of the base, and the support sections, respectively, and each angled by 45 degrees to form a complementary 90° angle when erected — see FIG. 7. The upstanding support sections are held in position by a pin and detent arrangement 67, 68; the pin is preferably slightly larger to provide an interference fit and hold the frame, when erected, in the position of FIG. 7.

FIG. 9 illustrates, in cross-sectional view, and in detail the matching surfaces 70, 71. The pin 67 is preferably made long enough so that the distance of the end of the pin 67 from the hinge line 63 is sufficiently greater than the radius from the hinge line 63 to the root of the pin 67, which would also be the distance from the hinge line 63 to the opening 68, so that the pin 67 will enter hole 68 with an interference fit, the support sections 60, 61 then being resiliently held together since in any position other than the erected position, as seen in FIG. 7, pin 67 will not fit exactly into opening 68. Pin 67 can readily be molded of the same material as the entire frame, and the opening 68 molded when the structure is first made.

Embodiment of FIGS. 10-12: The base 100 is formed of a flat sheet of material which has longitudinally extending ribs. The ribs, when erected, on one support section 101 will be opposite with respect to the other support section 102, that is the ribs will be facing in the same direction. When laid flat, the ribs on section 101 and on the base 100 will be facing downwardly, whereas the ribs on section 102 will be facing upwardly. Similar to the embodiment of FIGS. 3-5, the lateral position of the ribs in the upstanding sections 101, 102, as well as the ribs in the base 100 are laterally offset with respect to each other so that the three sections of the support can fold flat into each other as seen in FIG. 12, presenting a smooth outline at the outer surface. To provide for inward folding of side wall 101, it is slightly relieved at its hinge edge, as seen at 105. The side walls are held erect by means of a latch arrangement illustrated only in FIGS. 10 and 11, and omitted from FIG. 12 for clarity. A small tab 107 with a depression 107a internally thereof, with respect to the base, and which may be in form of a hole through the tab 107 engages a small projecting button 108 formed on the base (FIG. 11). Other arrangements are of course possible, such as a groove formed in the base which is engaged by a ridge formed on tab 107, or the like. Slanting surfaces 110, 111 provide for bearing surfaces to limit the travel over which the support sections 101, 102 can be swung when erecting the stand from the closed position shown in FIG. 12 to the open position of FIG. 10.

Two of the walls presented by the stand to the bag will be smooth, namely the interior walls of the base 100 and of the upstanding section 101; the other interior wall of upstanding section 102 will be ribbed; the ribs are not seen in FIG. 11 since they are hidden from view at all sides, only the smooth, inside walls of the base, and upstanding support section 101 being visible, as well as the outside wall of the other support section 102.

Embodiment of FIGS. 13 - 15: A base section 130 is interconnected by living hinges 133, 134 with upstanding support sections 131, 132 which, preferably, are notched as best seen in FIGS. 14 and 15, to save material. Other configurations of the side walls are of course possible, for example window openings, circular cut-outs and the like.

The bottom surface of the base 130, as seen in FIG. 14, is in alignment with the bottom surface of upstanding section 132; the bottom surface of upstanding section 131, however, is offset by half the thickness thereof, as seen at 138; the upstanding section 132 is relieved as seen at 139. The relief 139 fits against the end of side wall 131, and the notch formed by the half thickness 138 fits over and about the folded-over wall section 132 — see FIG. 13. Any suitable latch means, as explained in connection with any of the previous figures can be used to hold the wall sections erected and in position. Preferably, the bottom section 130 has a thickness slightly greater than that of the wall sections to provide for adequately dimensioned bearing surfaces 140, 141 between the base section and the upstanding support sections.

The present invention thus provides for a support structure for limp plastic bags which can be folded into flat, compact form and combined with a limp bag to hold the bag erected, and in position with a wide-mouth opening, spreading the entire circumference of the bag; insertion of the bag is simple, can be done with one hand if at least one of the upstanding wall sections is provided with a self-holding latch. When filled, the bag can be easily removed and if the upstanding sections are formed with material presenting a surface having interruptions dimensioned to prevent bulging of a filled bag between the sides, can again be removed by lifting straight out, even though the bag may be completely filled. The stops provided to define the erected size of the support need not provide for perpendicularly extending support sections; different angular orientations, for example outwardly diverging can also be used, although the capacity of the inserted bag will not then be used to its fullest advantage.

The stand, and the support may be made of almost any size, and will be lightweight, easy to clean and sanitary in use. The stand itself can be re-used for many bags, can readily be packaged separately or in combination with bags, and when folded flat takes little storage space.

The invention has been described in connection with stands made out of unitary sheets of polypropylene material, having living hinges interconnecting the base and the support sections thereof; other materials and other, equivalent types of hinges may be used; and many changes and variations may be made within the inventive concept.

I claim:

1. Foldable support for a limp plastic bag to keep the mouth of the bag open and erect comprising:

a unitary elongated flat strip-like element of thermoplastic material having transverse living hinges (23, 24; 33, 34), the hinges subdividing said strip-like element into a central base portion (20) and a pair of substantially similar support portions (21, 22) located at either side of the central base portion;

stop means (35, 36; 70, 71) formed on at least one of said portions adjacent the living hinges and bearing against an adjacent other portion when said support portions are swung to project approximately perpendicularly to said base portion and to support a bag between the erected support portions;

and engageable connecting means (37, 38; 67, 68; 107, 108) to connect adjacent portions and hold said adjacent portions in position such that the support portions extend approximately perpendicularly from the base portion.

2. Support according to claim 1 wherein the connecting means includes latching means interengaging the base portion and at least one of said support portions to lock said portions together.

3. Support according to claim 2 wherein the latching means comprises an opening formed in one of said portions and a matching projection formed on the other portion and fitting into said opening.

4. Support according to claim 3 wherein said projection includes a pin fitting into the opening with an interference fit.

5. Support according to claim 4 wherein the opening is straight and the pin extends towards the opening and projects from the tangent of the circle having the hinge line of the living hinge as the center by an amount sufficient to present an interference fit to the pin upon entering the opening.

6. Support according to claim 2 wherein the latching means comprises a projecting tab formed on one of said portions;

and matching recess and projections formed on the other of said portions and said tab, respectively.

7. Support according to claim 1 wherein the connecting means includes interengaging latching means formed on the base adjacent the hinge and on one of said support portions and locking said portions together in position to provide for approximately right angle extension of said support portions from said base portion.

8. Support according to claim 1 in combination with a bag of limp material, said support portions extending substantially parallel to each other, and perpendicularly to the base portion, said bag having bottom and side walls and an open mouth, the material adjacent said open mouth of said bag being folded over the free edges of said upstanding support portions;

the bottom of said bag bearing against said base portions of the strip-like element;

and two side walls of said bag being confined by said support portions.

9. Support according to claim 8 wherein said bag has a zone of weakened material adjacent the mouth thereof and forming a tear line;

and the length of said side walls of the bag is sufficiently longer than the length of the support portions to permit folding of the side walls of the bag over the support portions and beyond the region of said tear line.

10. Support according to claim 1 wherein the stop means comprises a region of flattened material and located adjacent said hinges, said flattened material being complementarily angled to provide a stop at an angle of about 90° between adjacent portions.

11. Support according to claim 1 wherein the material is sheet-like and formed with longitudinal ribs to provide stiffness, said ribs being offset transversely with respect to each other to permit flat folding of said portions against each other.

12. Support according to claim 1 wherein said strip-like element comprises a strip of material formed to provide a plurality of open frames of predetermined thickness;

and one of said portions is formed with an offset adjacent the hinge at least as deep as the thickness of said material to provide, when folded, a step to accommodate the thickness of the material of an opposed support portion and enable flat storage and folding of said support structure.

13. Support according to claim 12 wherein said strip of material is cut to provide frame-like portions.

14. Support according to claim 1 wherein one of said support portions has its surface adjacent the hinge line offset with respect to the hinge by a distance at least equal to the thickness of the other support portion to permit flat folding of said support portions against, and

nested into each other.

15. Folder support for a limp plastic bag to keep the bag open and erect comprising:

a unitary elongated strip of thermoplastic material having transverse living hinges and subdividing said strip into a central base portion and a pair of support portions;

and stop means formed on at least one of said portions adjacent the hinges and bearing against an adjacent other portion when said support portions are swung to project approximately perpendicular to said base portion and to support a bag between the erected support portions;

said support being further characterized in that said material is flat, the lateral edges of all said portions being formed with bent-over angles to provide stiffness for said flat material;

the distance between said angles being different on the different portions of said support to enable folding of said portions within each other without interference of said angles;

and said stop means comprising a strip of material located on one of said portions to bear against the end face of an angle on an adjacent portion.

16. Support according to claim 15 wherein said material is formed with mesh openings.

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