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3,155,356

RECEPTACLE SUPPORT

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FIG. 1

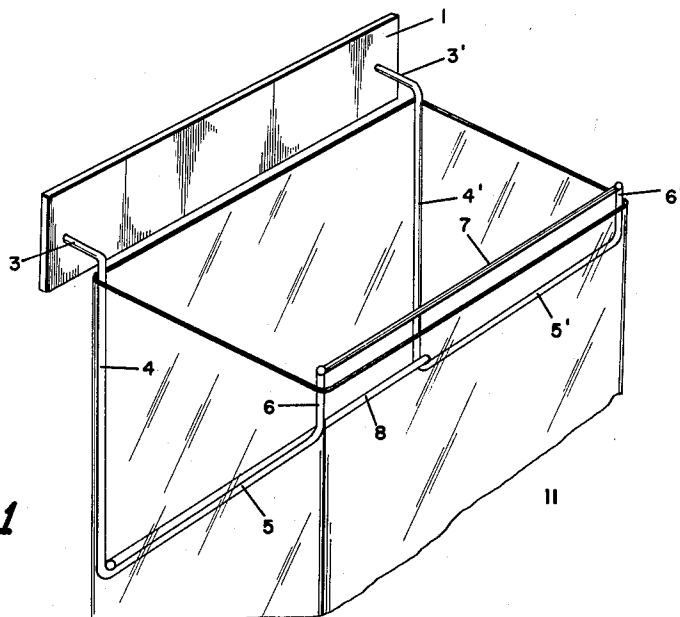
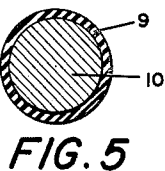
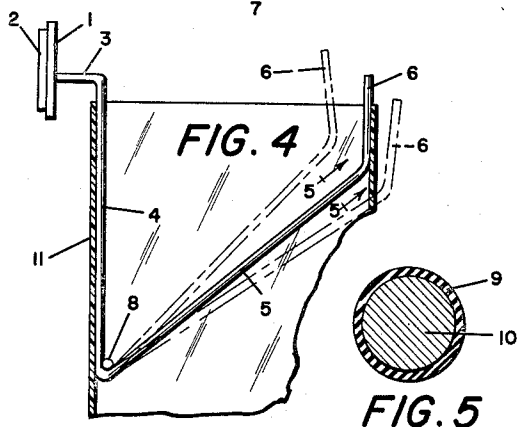
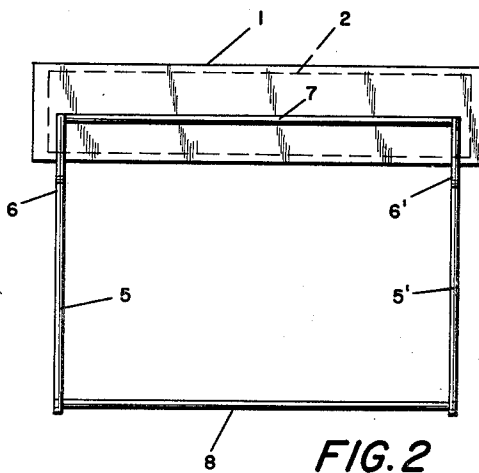
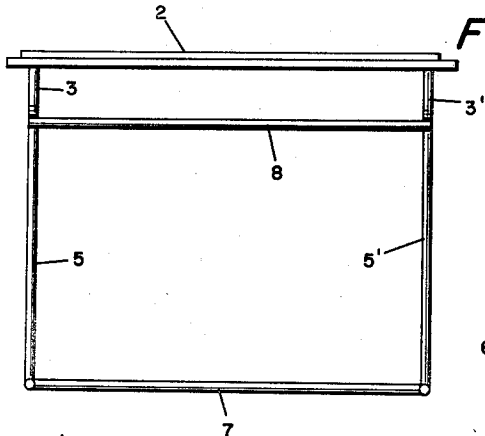


FIG. 3



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RECEPTACLE SUPPORT

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This invention relates to a supporting device for releasably holding bag-like receptacles in an open position to receive matter which is to be placed therein.

More particularly the invention relates to such a supporting device which includes members which are disposed inside of a bag-like receptacle and which are resiliently urged outwardly against the inside surface of the bag to support the bag by virtue of the frictional force between the bag and the members. Preferably the device is also so arranged that the forces exerted by the members on the inside of the bag increase as the weight of the bag and its contents increases.

While one important use of the device is as a "litter bag" holder for use in automobiles, the invention finds substantial utility in other analogous uses, and is particularly useful for releasably supporting disposable bag-like receptacles in the home, office, shop or outside. However, it will be apparent that the various manners of use of the invention are limited only by the desires of a particular user.

It is an object of this invention to provide a bag holding or supporting device which is capable of supporting a bag in the open position without the use of hooks, clamps or the like which characterize the majority of the analogous devices of the prior art, for instance, as shown in United States Patents No. 960,451, No. 1,760,752, No. 2,188,047, No. 314,770 No. 481,957, No. 690,412 and No. 400,191.

It is a further object of this invention to provide a device of the type previously set forth which will support a bag in the open position by virtue of frictional forces existing between the inside surface of the bag and parts of the device which are urged against the inside surface of the bag.

It is a further object of this invention to provide such a device in which arms or similar members are resiliently urged against the inside surface of the bag to hold the bag open and to support the bag, and which are so arranged that the arms tend to move outwardly against the inside surface of the bag with increasing force as the bag and its contents become heavier.

It is a further object of this invention to provide such a device which can be constructed almost wholly from a single length or piece of resiliently flexible material such as wire, plastic, wood, or the like.

It is yet a further object of this invention to provide such a device which can be attached to any convenient supporting surface.

Finally it is an object of this invention to provide a device of the type previously set forth which is simple and economical to manufacture, which is extremely convenient and dependable in use, and which includes no easily breakable components.

Other and further objects of the invention will be apparent to those skilled in the art from the following description taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a perspective view of one preferred embodiment of the invention, showing a bag in supported position.

FIG. 2 is an elevational view of the device shown in FIG. 1, but without the bag.

FIG. 3 is a plan view of the device shown in FIG. 1, also without the bag.

FIG. 4 is a side elevational view of the device of FIG. 1, with the arm shown also in the normal position and in the bag-mounting position.

FIG. 5 is a sectional view taken on the lines 5-5 of FIG. 4, and showing an example of a preferred constructional material.

Referring now to the drawings, in which like reference numerals designate like parts throughout, one preferred embodiment of the invention comprises a plate-like member 1 of any convenient material, such as sheet metal, wood or any of the various composition boards which are well known in the art. On the back face of member 1 is an adhesive or similar material 2 for attaching the member 1 to a vertical supporting surface. Although the illustrated embodiment utilizes an adhesive material, any desirable means of attachment may be used. When the device is of a size adapted for use as a "litter bag" in an automobile, it has been found to be highly convenient and satisfactory to use either small magnets or small screws or bolts for attaching the member 1 to a supporting surface. For applications where the device must be of a much larger size, bolts or screws inserted through the plate member 1 are considered to be preferable. Also, in many instances where circumstances permit, it has been found desirable to utilize hooks attached to the back surface of member 1 and which are attached to a horizontally extending edge on the supporting surface. Generally any convenient means may be used for attaching member 1 to a supporting surface, since the particular means used is not an important element of the invention.

Extending outwardly from member 1 are two spaced substantially parallel and horizontal arms 3 and 3'. Where the member 1 is made of sheet metal or a similar metallic material, arms 3 and 3' can be welded or braised thereto. Alternatively, arms 3 and 3' can be inserted through holes bored in the member 1, and the portions extending through to the back surface of member 1 can be turned against the back surface and attached thereto. Preferably arms 3 and 3', as well as the other arms of the device, are shaped from a flexible material such as spring wire. Arms 4 and 4' extend substantially vertically downward from arms 3 and 3', and are bent upwardly at desired points so as to form arms 5 and 5'. Arms 5 and 5' extend outwardly from arms 4 and 4' at an angle to the horizontal, and are curved as shown in the drawings to form substantially vertical arms 6 and 6'. The upper ends of arms 6 and 6' are maintained in spaced relationship by member 7, which preferably is an extension of the material forming arms 6 and 6'. A member 8 is joined to the device, for instance by braising, in the vicinity of the bends between arms 4 and 5 and arms 4' and 5', respectively. As will be apparent from the drawings, except for the members 1 and 8 the entire device can be formed from a single length of spring wire or similar material.

A bag 11 supported by the device is partially shown in FIG. 4. In order to mount the bag on the device, it is merely necessary to flex arms 6 and 6' and member 7 inwardly toward member 1, as shown in FIG. 4, from the unflexed position, and then to move the bag upwardly around arms 4, 4', 6 and 6' until the mouth of the bag is located well up on these arms. When the arms are then released arms 6 and 6' will be urged resiliently outwardly against the inner surface of the bag, and the material of the bag will be placed in tension by the resilient forces. The bag is supported in position by frictional forces between the arms and the inner surface of the bag. The requisite force exerted by the arms on the inner surface of the bag and the coefficient of friction of the vertical arms will be made adequate for the service intended and varies with the particular use of the device. The required force and frictional coefficient can be varied in a

number of convenient ways. In the illustrated embodiment, the arms are formed from a spring wire 10 having an outer coating of rubber or similar material having a relatively high coefficient of friction, as shown in FIG. 5.

The frictional forces which are present as a result of the vertical arms being urged against the inner surface of the bag are sufficient in many applications to maintain the bag in position even as its weight increases as materials are placed therein. However, in order to multiply the range of uses of the device, preferably it is so constructed that the vertical arms will be urged against the bag with increasing force as the weight of the bag and its contents increase. This is accomplished by reason of the arms 5 and 5' tending to increase the distance between vertical arms 4 and 4' and vertical arms 6 and 6' as the downward pull of the bag is applied to arms 6 and 6'. For instance, referring to FIG. 4 of the drawings, as the weight of the bag tends to move arm 6 downwardly, arm 5 tends to pivot or flex about its lower end, and since arm 5 is angled upwardly any movement toward the horizontal will tend to move arm 6 away from arm 4, thus increasing the contact pressure between the vertical arms and the inner surface of the bag. In the case of relatively very heavy loads, there is also a tendency for arms 4 and 4' to pivot clockwise about the points where they join arms 3 and 3', as viewed in FIG. 4. However, this action normally is not objectionable, but rather in many instances it is desirable since movement of arms 4 and 4' away from the vertical in the described manner actually increases the supporting force of these arms against the bag. It will be understood that the tendency of the vertical arms to tighten against the inner surface of the bag is dependent upon the distance between arms 4 and 6, for instance, and that by increasing this distance the tightening tendency is also increased, at least within certain practical limits. It has been found that devices actually constructed according to the illustrated embodiment function very satisfactorily. For instance, one such device was constructed of a size acceptable for use as a "litter bag" holder for automobiles, using wire of a size corresponding approximately to the wire used in standard sized paper clips. Since bare wire was used, a rubber tape was applied to portions of the vertical arms. When tested with small plastic bags of types currently commercially available for food packaging, in every instance it was found that the bag would split or tear from overload before any appreciable slipping of the bag occurred.

As previously mentioned, the device can be constructed in any desirable size so as to be usable with bags of any size or material. When adapted for use as a "litter bag" holder, it has been found that the device conveniently can be constructed to a size approximately one and one half to two times as large as shown in the drawings. When constructed in such a size, the device can be used either with paper bags or with small plastic bags, for instance of the type which are currently commercially available in roll form. When full the bag can be discarded and another bag easily placed on the device. "Litter bag" sized devices can have advertising messages printed on the plate-like member 1, and will be sufficiently inexpensive to be given away by companies as favors to their customers. Also, small bags with or without advertising messages could be supplied by automobile service stations as a service to their customers. Furthermore, the planes defined by members 4 and 4' or the members 6 and 6' could be formed as planar surfaces to carry advertising messages, particularly when transparent plastic bags are to be used. The device can be manufactured in larger sizes for use as a support for bag-like garbage receptacles, for instance, or for any number of uses where bag-like receptacles are appropriate.

The device can be constructed as shown in the drawings for attachment to a vertical surface, or alternatively the arms 3 and 3' can constitute straight extensions of the arms 4 and 4' so as to permit the device to be attached to

a horizontal surface so as to depend downwardly therefrom. While it is preferred that arms 3 and 3' be formed so as to have the bag supporting arms displaced from the plate member 1, in many instances the arms 4 and 4' can be attached directly to the plate member. Instead of attaching the device to the plate member 1 by welding or through bored holes or the like, the flexible material can be formed as hooks which attach to the plate member 1. Furthermore, for many uses of the device there is no need for the plate member 1, and alternatively the arms 3 can be bent so as to form eyes through which screws can be inserted or to which magnets or the like can be attached. While the arms 4 and 6 are shown as being vertical, they can be formed so as to have only portions thereof vertical, or alternatively the arms can be disposed at angles to the vertical. The vertical arms 6 and 6' can be very short, and can be omitted in some instances, with the member 7 then joining the upper ends of the arms 5 and 5'. However, if the members 6 and 6' are omitted it is desirable to increase the surface frictional coefficient of member 7 and the extreme outer ends of arms 5 and 5'. Because of the tightening tendency of the device, the device will still support the bag when arms 6 and 6' are omitted, although possibly not as satisfactorily as when they are present. It will be understood also that members 6 and 6' can be formed to depend downwardly rather than upwardly from arms 5 and 5', in which event arms 5 and 5' preferably should be lengthened and extended upwardly at a greater angle to the horizontal. However, such a modification normally requires a greater length of material. While arms 5 and 5' are shown in the drawings as extending continuously upwardly at an angle from arms 4 and 4', arms 5 and 5' can be formed so as to have portions thereof leading from arms 4 and 4' at various angles, as long as at least a portion of these arms preferably extend simultaneously upwardly and outwardly from arms 4 and 4' so as to effect the tightening tendency. If desired arms 5 and 5' need not be completely parallel, but rather could be formed so as to extend generally toward each other, although such an arrangement would provide a receptacle with a smaller open mouth. Although it would be much more expensive, arms 4 and 4' could be replaced by a solid substantially planar member, and if further desired, arms 5 and 5' could be hinged to members 4 and 4' so as to pivot thereabout, but this would necessitate the use of springs to effect the desired resiliency. Although a resilient metallic material is preferred for the forming of the various arms and members, they could be formed wholly or partially from a resiliently flexible plastic or other material having these properties. Alternatively, the device except for a portion of arms 5 and 5' could be constructed from a relatively rigid material, and by using pivotal connections between arms 4 and 5, substantially the entire device could be fabricated from relatively rigid material. Furthermore, the device could be formed from a single flat member of rectangular shape by cutting out a portion of the center of the member and then forming the member to a cross-sectional shape generally as shown in the drawings. If the device is constructed so as to have little or no tightening tendency upon increased load, it is normally necessary, or at least preferable, that the members which frictionally engage the inner surface of the bag be longer and have relatively higher coefficients of surface friction so as to allow for increased load in the bag. It will be understood also that a device constructed of a particular size is not limited to use with bags of only a particular size, but rather a single device can be used with bags of several different sizes. Within certain practical limits, the device can be deformed so as to have the outer vertical arms normally closer to or further from the inner vertical arms so as to vary the ranges of bag sizes with which the device normally can be used. While rubber covered wire has been found to be very convenient for use as the arms of the device because of the relatively high frictional coefficient, any analogous frictional mate-

rial can be used, and alternatively very small serrations or corrugations can be formed in portions of the vertical arms.

It will be readily apparent to those skilled in the art that the embodiment described and illustrated herein is susceptible of various modifications without departing from the spirit of the invention. Therefore it should be understood that the foregoing is merely exemplary and illustrative, and is not to be taken as limiting in any sense. Rather the invention is intended to be limited only by the subjoined claims as interpreted in the light of the foregoing disclosure.

Having thus fully described my invention in the manner required by the patent statutes, I claim:

1. A releasable friction-type bag supporting device comprising: first and second downwardly extending members in substantially parallel relationship; at least a third member spaced outwardly from said first and second members; means for resiliently urging said third member against relative movement toward said first and second members and for tending to move said third member relatively away from said first and second members when a downward force is applied to said third member relative to said first and second members; means for imparting a relatively high frictional resistance to at least portions of said first, second and third members; and means for supporting the entire assembly; whereby a bag-like receptacle placed upwardly around said three members when said third member is forced toward said first and second members will be frictionally supported by said members when said third member moves outwardly under said resilient force.

2. A releasable bag holder comprising: first and second substantially vertical members; means for maintaining said first and second members horizontally spaced from each other; third and fourth parallel members connected to the lower portions of said first and second members and extending upwardly and outwardly therefrom for at least a portion of their lengths; means extending between and connecting said third and fourth members adjacent their upper ends; at least a portion of said third and fourth members being resiliently flexible, whereby a bag-like receptacle placed upwardly around said four members when said third and fourth members are flexed toward said first and second members will be supported by said four members when said third and fourth members are permitted to flex away from said first and second members, and the moment created by the weight of a bag-like receptacle on said third and fourth members will tend to move the outer ends of said third and fourth members away from said first and second members, thus increasing the holding force exerted by the four members on the bag.

3. Apparatus as set forth in claim 2 wherein said third and fourth parallel members have substantially vertical portions adjacent their outer ends, and wherein at least portions of the vertical portions of each of said four members have surfaces of relatively high frictional coefficients.

4. A releasable friction-type bag supporting device comprising: first and second substantially vertically disposed rod-like members in horizontally spaced relationship; third and fourth substantially vertically disposed rod-like members in horizontally spaced relationship; means for supporting said third and fourth members in a common plane displaced outwardly from the common plane of said first and second members, for resiliently urging said third and fourth members against movement toward said first and second members, and for tending to increase the distance between said third and fourth members and said first and second members when a downward force is applied to said third and fourth members relative to said first and second members; and means for supporting said first and second members; whereby

a bag-like receptacle placed upwardly around said four members when said third and fourth members are forced relatively toward said first and second members will be supported by frictional force when said third and fourth members are permitted to move away from said first and second members, and whereby said bag will be held more tightly as the weight thereof increases.

5. Apparatus as set forth in claim 4 wherein said means for supporting said first and second members comprises means for attachment to a supporting surface and means extending horizontally from said attachment means and connected to said first and second members on the side thereof removed from said third and fourth members.

6. Apparatus as set forth in claim 4 wherein said means supporting and urging said third and fourth members comprises at least one resiliently flexible member extending between at least one of said first and second members and at least one of said third and fourth members, at least a portion of said resiliently flexible member extending upwardly and outwardly in a direction from said first and second members toward said third and fourth members to constitute a moment arm.

7. A releasable friction-type supporting device for a bag-like receptacle, comprising: a substantially plate-like member; means for attaching said plate-like member to a supporting surface; two spaced parallel first arms extending horizontally outwardly from said plate-like member; two downwardly extending parallel second arms connected at their upper ends to the outer ends of said first arms; two outwardly and upwardly extending parallel third arms connected to the lower portions of said second arms and having at least a portion extending simultaneously upwardly and outwardly; means for maintaining each of said arms horizontally displaced from its corresponding parallel arm; at least a part of said simultaneously upwardly and outwardly extending portions of said third arms being resiliently flexible so as to constitute at least a point about which said third arms may pivot as moment arms to increase the distance between said second arms and the outer portions of said third arms when a supported receptacle tends to move said outer portions of said third arms downwardly.

8. Apparatus as set forth in claim 7 wherein all of said arms are fabricated from a single length of resiliently flexible material.

9. Apparatus as set forth in claim 8 wherein said third arms have substantially vertically extending portions at their outer ends.

10. A releasable friction-type supporting device for a bag-like receptacle, comprising: first downwardly extending means for insertion into a bag to bear against a portion of the inside surface thereof; second downwardly extending means for insertion into a bag to bear against a portion of the inside surface thereof substantially oppositely disposed from the portion against which said first means bear; and means for resiliently urging said first means and said second means away from each other and against the respective portions of the inner surface of a bag in which said means may be located and for tending to increase the distance between said first means and said second means upon the application of a downwardly directed force upon said second means, whereby a bag can be supported by frictional forces which increase as the weight of the bag increases; and means for supporting the entire device.

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