United States Patent

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[72] Inventor **Kai Ropche Farrelli**
5450 Russell Ave., Apt. 1, Hollywood, Calif. 90027

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[54] **BAG EXPANDER**
12 Claims, 15 Drawing Figs.

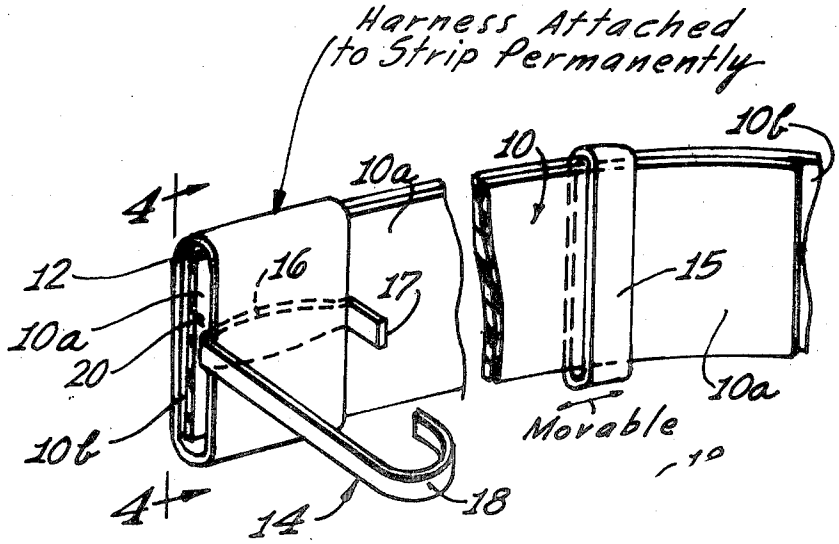
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[56] **References Cited**
UNITED STATES PATENTS

497,870	5/1893	Fjellman	248/99
632,793	9/1899	Sell	24/170
991,081	5/1911	Parr	248/99
2,639,110	5/1953	Nicolas	248/99
3,240,457	3/1966	Backlund et al.	248/99

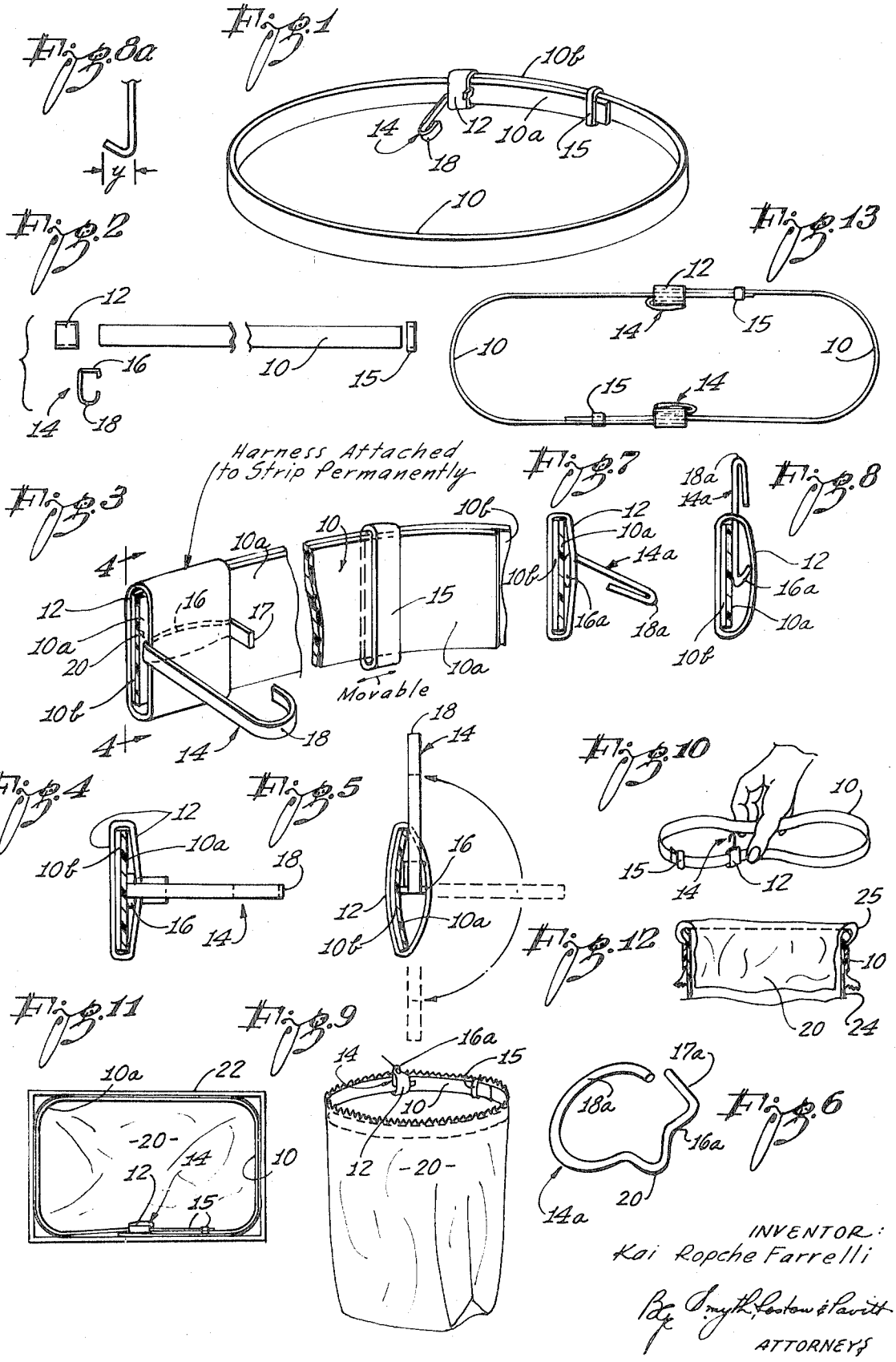
Primary Examiner—Chancellor E. Harris
Attorney—Smyth, Roston & Pavitt

ABSTRACT: A plastic belt is expanded inside a paper bag to convert the paper bag to an upright self-supporting disposable waste receptacle, the belt having the equivalent of a buckle means which may be used to suspend the receptacle from a hook on a wall.



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BAG EXPANDER

BACKGROUND OF THE DISCLOSURE

Receptacles that are commonly used for trash eventually become soiled, unsightly and unsanitary and especially so when used in kitchens, garages, workshops, trailers and hospitals. There is a pressing need, therefore, for such a receptacle that is so inexpensive that it may be discarded after a short period of use. Ideally the cost should be so low as to make it economical to dispose of the receptacle the first time it becomes filled with trash.

A further need exists in many instances for such a receptacle that may hang on a wall. In other instances there is a need for such a receptacle that can be suspended from the belt of a workman, for example a workman who is picking fruit or a workman who is picking up litter in a public place. In addition, there are instances where the need is for a disposable liner cheaper than other types of liners for use inside a waste basket.

It has been proposed heretofore to meet some of these needs by means of more or less elaborate metal frames designed to support paper bags in open position. Such metal frames are disclosed, for example, in the following patents:

	U.S. Pat. Nos.
Brown	134,637
Parr	991,081
Reed	1,086,218
Heyer	1,650,447
Happer	1,760,752
Colthurst et al.	3,130,853
Backlund et al.	3,240,457

All of these prior art devices have the capability of meeting one of the four above-mentioned needs, but none can meet all four of the needs. In addition the prior art devices are, in general, cumbersome, relatively expensive, and too conspicuous for their purpose.

The object of the present invention is to meet all of the four listed needs by a device that is of minimum cost and minimum bulk and is inconspicuous in use.

SUMMARY OF THE INVENTION

Broadly described, the preferred embodiment of the invention comprises a flexible strap or belt with a suitable securing means to hold the belt in a closed loop that may be expanded by infinite increments. In the principal use of the invention, the looped strap is expanded to such an extent inside the open end of a common paper bag as to place the looped strap under substantial circumferential compression and thereby place the paper back under corresponding circumferential tension to convert the flimsy paper bag into an upright self-supporting receptacle. When the bag is full of trash it is a simple matter to remove the confined looped strap and to dispose of the filled paper bag.

Preferably the adjustable securing means to retain the strap in loop form has an eye or hook by means of which the expanded paper bag may either be suspended on a wall or attached to a workman's belt. The adjustable loop may also be used inside the open end of a paper bag to expand the paper bag against the inner wall of a surrounding rigid receptacle so that the paper bag functions as a liner for the receptacle. Since the strap is flexible, it is capable of making the paper bag liner conform to a noncircular receptacle, for example a receptacle that is rectangular in cross section.

In another use of the looped strap, a paper bag employed as a liner inside a rigid receptacle has a marginal portion folded over the rim of the rigid receptacle and the strap loop may be used in tension to clamp the overhanging margin of the paper bag against the outside of the rigid receptacle.

One feature of the invention is that two of the straps may be connected end to end to function as a single loop for use with an unusually large paper bag. Another feature of the invention is that the strap may be made of inexpensive plastic and the securing means for holding the two overlapping ends of the strap together may comprise simply a plastic collar that embraces the overlapping ends of the strap, the plastic collar being employed in combination with a clamping member in the form of a bent wire that cooperates with the collar to clamp the overlapping strap ends together.

Still another important feature of the invention is a technique for adjusting the strap loop in such manner as to place a paper bag under any desired magnitude of circumferential tension.

A further feature is a procedure for removing the looped strap from a bag and replacing it in a new bag of the same size without the necessity of either loosening or adjusting the looped strap.

The features and advantages of the invention may be understood by reference to the following detailed description and the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings, which are to be regarded as merely illustrative:

FIG. 1 is a perspective view of a selected embodiment of the looped strap with the clamping member in release position to permit the overlapping ends of the strap to be adjusted relative to each other for expanding and contracting the strap loop;

FIG. 2 is an elevational view of the separate parts of the device shown in FIG. 1;

FIG. 3 is an enlarged fragmentary perspective view showing the clamping member in release position to permit expansion or contraction of the loop;

FIG. 4 is a sectional view taken as indicated by the line 4—4 of FIG. 3 showing the clamping member in release position;

FIG. 5 is a similar view showing the clamping member in its clamping position;

FIG. 6 is an elevational view of a clamping member comprising a piece of formed wire that may be substituted for the clamping member shown in FIGS. 3 to 5;

FIG. 7 is a view similar to FIG. 4 showing the formed wire member in its released position;

FIG. 8 is a similar view showing the formed wire in its clamping position;

FIG. 8*a* is a fragmentary view of the wire clamping member showing its two effective cross-sectional dimensions;

FIG. 9 is a perspective view of a paper bag with the looped strap installed therein;

FIG. 10 is a perspective view showing how the looped strap may be resiliently deformed either for the purpose of removing the looped strap from a bag or for the purpose of installing the looped strap in a bag;

FIG. 11 is a plan view showing how the looped strap may be employed inside a paper bag to anchor the paper bag inside a receptacle of rectangular cross section, the bag serving as a liner for the receptacle;

FIG. 12 is a fragmentary sectional view showing how a margin of a paper bag liner for a rigid receptacle may be folded over the rim of the receptacle and clamped against the outside of the receptacle by the looped strap; and

FIG. 13 is a plan view showing how two straps may be connected end to end to form a relatively large strap loop for use in the relatively large bag.

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIGS. 1–3 illustrate an embodiment of the invention which comprises: a strap **10** formed into a closed loop with two ends **10***a* and **10***b* of the strap overlapping each other; a collar **12** that embraces the overlapping strap ends and is attached directly to strap end **10***b*; and a clamping member **14** which in combination with the collar serves as securing means to releasably hold the two strap ends against mutual slippage. In the preferred practice of the invention a second narrower col-

lar 15 slidingly embraces strap ends but this second collar may be omitted if desired.

As indicated in FIGS. 4, 5 and 6, the strap 10 may comprise a band of suitable plastic material such as high impact styrene and the collars 12 and 15 may also be made of a suitable plastic and may be sheared from a plastic tube. As shown in FIGS. 4, 5 and 6, the clamping member 14 may be a C-shaped piece of flat metal stock with one arm extending into the collar 12 to serve as a clamping portion 16 of the clamping member. As best shown in FIG. 3 the clamping portion 16 has an end flange 17 to keep it from being withdrawn from the collar. The other arm of the C-shaped clamping member is a handle portion 18 which is preferably curved as shown.

The clamping portion 16 of the clamping member 14 has a width dimension that is substantially larger than its thickness dimension and the clamping portion extends into a clearance space 20 between the inner surface of the collar 12 and the strap end 10*b* on which the collar is mounted. When the second strap end 10*a* is inserted into the collar 12 in overlapping relationship with the strap end 10*b* as shown in FIG. 1, the clearance space 20 is reduced by the thickness of the strap end 10*a*.

In FIG. 3 the clamping member 14 is in its release position with the thickness of the clamping portion 16 extending into the clearance space 20, the handle portion 18 of the clamping member extending laterally of the strap ends. Thus as shown in FIG. 1 the handle 18 extends towards the center of the loop when the strap is formed into a loop. The handle portion 18 of the clamping member 14 may be rotated about the clamping portion 16 as a pivot between the release position of the clamping member shown in FIG. 4 and the clamping position shown in FIG. 5. In the clamping position of the clamping member shown in FIG. 5 the width dimension of the clamping portion 16 is interposed between the two overlapping strap ends and a portion of the inner surface of the collar 12, the width dimension being of sufficient magnitude to place the collar under stress and thereby clamp the overlapping strap ends against a second portion of the inner surface of the collar that is opposite from the first portion. It can be seen in FIG. 5 that in the clamping position of the clamping member 14 the handle portion 18 extends generally axially of the closed loop.

FIG. 6 shows a preferred embodiment 14*a* of the clamping member which is in the form of a piece of relatively stiff wire that is bent to a configuration to serve the purpose of the clamping member. In FIG. 6 the clamping portion 18*a* of the clamping member is formed with a flange 17*a* and is further formed with a curved offset 20 which has the effect of giving the clamping portion a width dimension that is substantially greater than its thickness portion. The clamping member 14*a* is formed with the usual curved handle portion 18*a*.

Preferably as shown in FIGS. 7 and 8 the width dimension of the clamping portion 16*a* of the clamping member is at an acute angle relative to the handle portion 18 instead of being substantially perpendicular to the handle portion. It is apparent from FIGS. 7 and 8 that when the handle portion 18*a* is swung upward from the release position shown in FIG. 7 to the clamping position shown in FIG. 8 the clamping portion 16*a* swings past center with respect to the inner surface of the collar 12 so that there is a tendency for the clamping member to snap into its clamping position as it approaches its clamping position and when the clamping member is in its clamping position it is resiliently biased to tend to keep its clamping position.

The wire clamping member 14*a* does not swing to a clamping position at which its full width dimension is interposed between the two strap ends and the inner surface of the collar but instead swings to a clamping position at which the width dimension of the clamping portion is canted. But, in both forms of the clamping member the dimension of the clamping portion that is actually effective between the overlapping strap ends and the inner surface of the collar is substantially greater at the clamping position of the clamping member than at the release position. The cross-sectional dimension of the wire clamping member 14*a* that is effective at its clamping position is indicated at Y in FIG. 8*a*.

FIG. 9 shows how the strap 10 formed into a closed loop with the overlapping ends held against slippage by the clamping member 16*a* stretches the open end of a paper bag 20 circumferentially to hold the open end of the bag under tension and thus cause the bag to stand upright in a self-supporting manner It is a simple matter to place the looped strap inside a paper bag in the position shown in FIG. 9 and to expand the loop and then secure the loop in expanded state but it is difficult to expand the strap in this manner sufficiently to place the paper bag under optimum circumferential tension.

A feature of the invention in this regard is the concept of carrying out the following steps to make sure to place the open end of the bag under substantial circumferential tension. The first step is to insert the looped strap into the open end of the paper bag with the clamping member in release position. The second step is to expand the strap manually sufficiently to place the paper bag under moderate circumferential tension and then to swing the clamping member to its clamping position. The third step is to manually distort the strap loop to hourglass configuration as shown in FIG. 10 while the overlapping strap ends are still clamped together and thereby contract the strap in overall dimension sufficiently to permit removal of the strap loop from the bag. The next step is to release the clamping member of the closed loop and carefully slide one of the two overlapping ends approximately one-fourth inch relative to the other to expand the loop accordingly, the clamping member then being restored to its clamping position. The next step is to deform the expanded loop again to the hourglass configuration shown in FIG. 10. The final step is to insert the deformed expanded loop into the bag and to manually restore the loop to its circular configuration with consequent substantial stressing of the loop in circumferential compression to place the open end of the bag under the desired high circumferential tension.

Once the looped strap is adjusted to place the open end of a paper bag under the desired high-tensile stress, it need not be adjusted again for use in a succession of bags of the same size. It is a simple matter to distort the looped strap to hourglass configuration for the purpose of transferring the looped strap from one bag to another.

It may be noted in FIG. 9 that the handle portion 18*a* extends upward from the open end of the bag. The upwardly extending handle portion 18*a* may be hung on a nail on a wall to suspend the open bag, or if desired, the handle portion may be employed to attach the open bag to the belt of a workman.

FIG. 11 shows how the paper bag 20 may be used to line a receptacle 22 of rectangular cross-sectional configuration such as a waste basket. With the paper bag 20 telescoped into the receptacle 22, the strap 10*a* is expanded and clamped as shown to expand the bag against the receptacle 22 and to hold the bag in position. Here again the strap may be removed, enlarged and replaced to cause the strap to act with adequate pressure against the inner surface of the receptacle 22.

FIG. 12 shows how a paper bag 20 may be telescoped into a rigid receptacle 24 with a marginal portion 25 of the open end of the bag folded down over the rim of the rigid receptacle. The strap 10 is employed in circumferential tension instead of circumferential compression to clamp the exterior marginal portion 25 against the outer surface of the receptacle, the clamping member of the belt being on the outer circumference of the loop instead of being on the inner circumference. The strap loop may be dismantled and then reversed to make the conversion or the strap loop may be simply turned inside out to make the conversion.

FIG. 13 shows how two straps 10 may be interconnected end to end to serve as a single relatively large strap to cooperate with a paper bag of relatively large size. Each of the two collars 12 in FIG. 13 embraces overlapping ends of the two straps respectively.

My description in specific detail of the preferred practices of the invention will suggest various changes, substitutions and

other departures from my disclosure within the spirit and scope of the invention.

I claim:

1. In a belt, the combination of:
a strap formed into a closed loop with the opposite ends of the strap overlapping;
a collar embracing the overlapping strap ends with a given clearance between a first portion on the inner surface of the collar and the overlapping strap ends; and
a clamping member having a clamping portion extending into the collar from one end thereof into the clearance space between the inner surface of the collar and the overlapping strap ends, said clamping member having a handle portion extending outward from the collar to swing about the clamping portion as a pivot between a release position and a clamping position,
said handle portion extending laterally from the overlapping strap ends at its release position and extending generally axially of the loop at its clamping position,
said clamping portion having a first cross-sectional dimension and a second cross-sectional dimension substantially greater than the first cross-sectional dimension at an angle relative to the first cross-sectional dimension,
the first cross-sectional dimension of the clamping portion being interposed between the two straps and said first portion of the inner surface of the collar at the release position of the handle portion,
the second cross-sectional dimension of the clamping portion being interposed between the two straps and said first portion of the inner surface of the collar at the clamping position of the clamping member,
said second cross-sectional dimension being sufficiently greater than the thickness of said clearance to cause the clamping portion to clamp the overlapping strap ends against a second portion of the inner surface of the collar opposite from said first portion at the clamping position of the clamping member.

2. In a receptacle for trash or the like, the combination of:
an upright paper bag with an open upper end;
a flexible plastic strap formed into a loop with overlapping ends and positioned wholly inside the paper bag near the upper open end thereof; and
securing means releasably holding the overlapping ends of the strap together,
said paper bag being sufficiently stiff to be not only self-supporting in its upright position but also to support the weight of the strap loop,
said strap loop acting under circumferential compression to hold the open upper end of the bag open and to place the open upper end of the bag under sufficient circumferential tension to cause the paper bag to support the strap loop solely by frictional contact between the loop and the bag.

3. A combination as set forth in claim 2 in which said securing means releasably clamps the overlapping ends together to permit infinite adjustment in the dimension of the loop.

4. A combination as set forth in claim 2 in which said securing means comprises:
a collar embracing the two overlapping ends transversely thereof; and
a clamping member extending into the collar and being adjustable to exert pressure outwardly against a first portion of the inner surface of the collar and pressure inwardly against the two overlapping strap ends to clamp the two strap ends against a second portion of the inner surface of the collar that is opposite from the first portion.

5. In a device for positioning inside the open end of a paper bag to expand the open end and enable the bag to stand upright to serve as a self-supporting receptacle, the combination of:
a flexible strap forming a closed loop with its opposite ends overlapping; and
securing means releasably clamping the overlapping ends of the strap together to permit infinite adjustment in the dimension of the loop to fit into bags of various girth dimensions,
said securing means further including a clamping member extending into the collar and adjustable to exert pressure outwardly against a first portion of the inner surface of the collar and pressure inwardly against the two overlapping strap ends to clamp the two strap ends against a second portion of the inner surface of the collar that is opposite from the first portion,
said clamping member having a clamping portion extending into the collar from one end thereof and a handle portion extending outwardly from the collar laterally thereof,
said clamping portion having a first cross-sectional dimension and a second cross-sectional dimension substantially greater than the first cross-sectional dimension at an angle relative to the first cross-sectional dimension,
said handle portion being swingable about the clamping portion as a pivot between a release position extending laterally from the overlapping strap ends at which the first cross-sectional dimension of the clamping portion is interposed between a portion of the inner surface of the collar and the two overlapping strap ends,
first cross-sectional dimension of the clamping portion being interposed between the two straps and said first portion of the inner surface of the collar at the release position of the handle portion,
said second cross-sectional dimension being of a magnitude to place the collar under substantial stress for clamping action against the overlapping strap ends at the clamping position of the handle portion.

6. A combination as set forth in claim 5 in which said handle portion extends generally axially of the loop at its clamping position and is shaped and dimensioned to engage support means such as a nail on a wall to suspend the open bag.

7. A combination as set forth in claim 5 in which said clamping means is a bent strip of flat metal stock.

8. A combination as set forth in claim 5 in which said clamping member is a piece of stiff wire of generally C-shaped configuration having one of its arms extending into the collar to serve as the clamping portion, the other arm serving as the handle portion,
said clamping portion of the wire having an offset to provide said second cross-sectional dimension.

9. A combination as set forth in claim 5 in which said handle portion extends at an acute angle from the second cross-sectional dimension of the clamping portion to cause the second cross-sectional dimension to swing past center relative to said portion of the inner surface of the collar when the handle portion is swung from its release position to its clamping position,
whereby the clamping member tends to snap into its clamping position and is biased to maintain its clamping position by the tension of the collar.

10. A combination as set forth in claim 5 in which said collar is attached to one of the two ends of the strap.

11. A combination as set forth in claim 10 which includes a second collar freely slidable along the overlapping strap ends to keep the overlapping strap ends together.

12. A method of enabling a paper bag to stand upright in a self-supporting manner to serve as an open receptacle, characterized by the steps of:
providing an elongated resiliently flexible member of a length exceeding the girth dimension of the bag;
overlapping the opposite ends of the member to form the member into a closed loop;
positioning the loop inside the open end of the bag and adjusting the overlap of the ends of the member to expand the loop snugly against the inner surface of the bag;
securing the overlapping ends together to maintain the expanded dimension of the loop;
removing the expanded loop from inside the bag while the overlapping ends are secured to each other;

releasing the overlapping ends from each other temporarily and reducing the overlap to expand the loop further;

again securing the overlapping ends together while the loop is thus further expanded;

bowing at least one portion of the expanded loop inwardly to distort the loop to configuration of reduced cross dimension;

inserting the distorted loop into the open end of the bag; and

restoring the configuration of the loop against the inner surface of the bag to place the loop under circumferential compression stress to cause corresponding circumferential tensile stress in the open end of the bag.

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