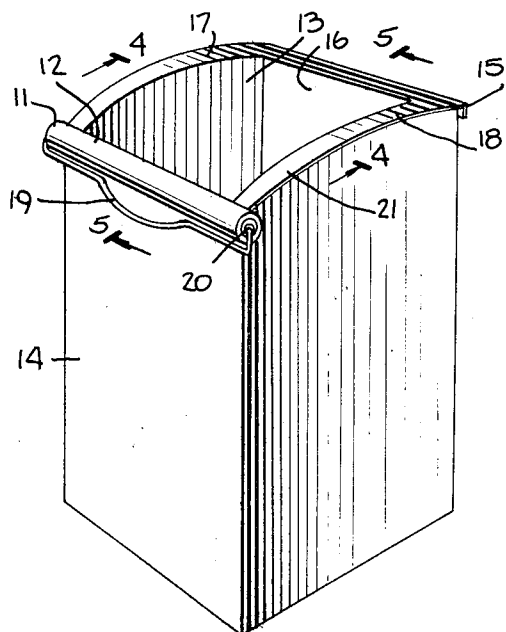


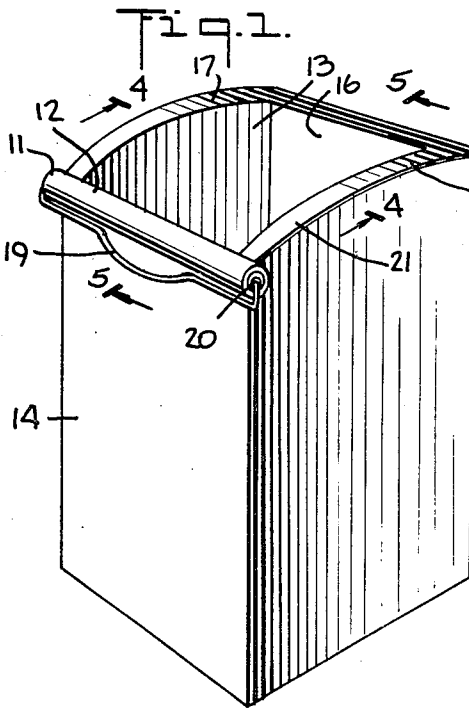
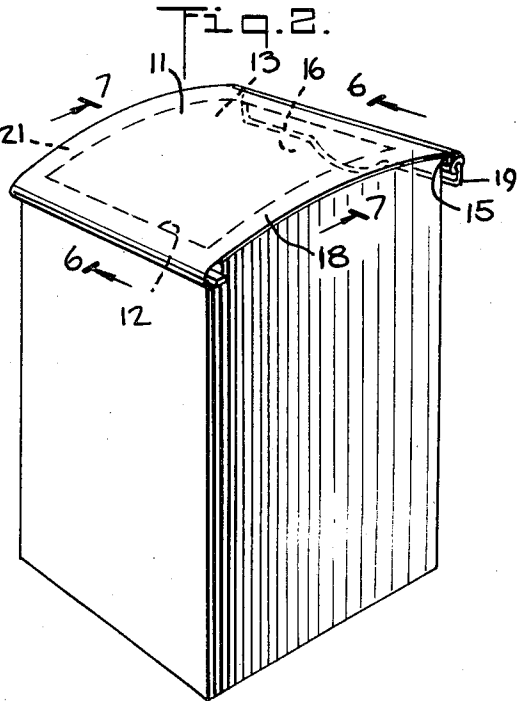
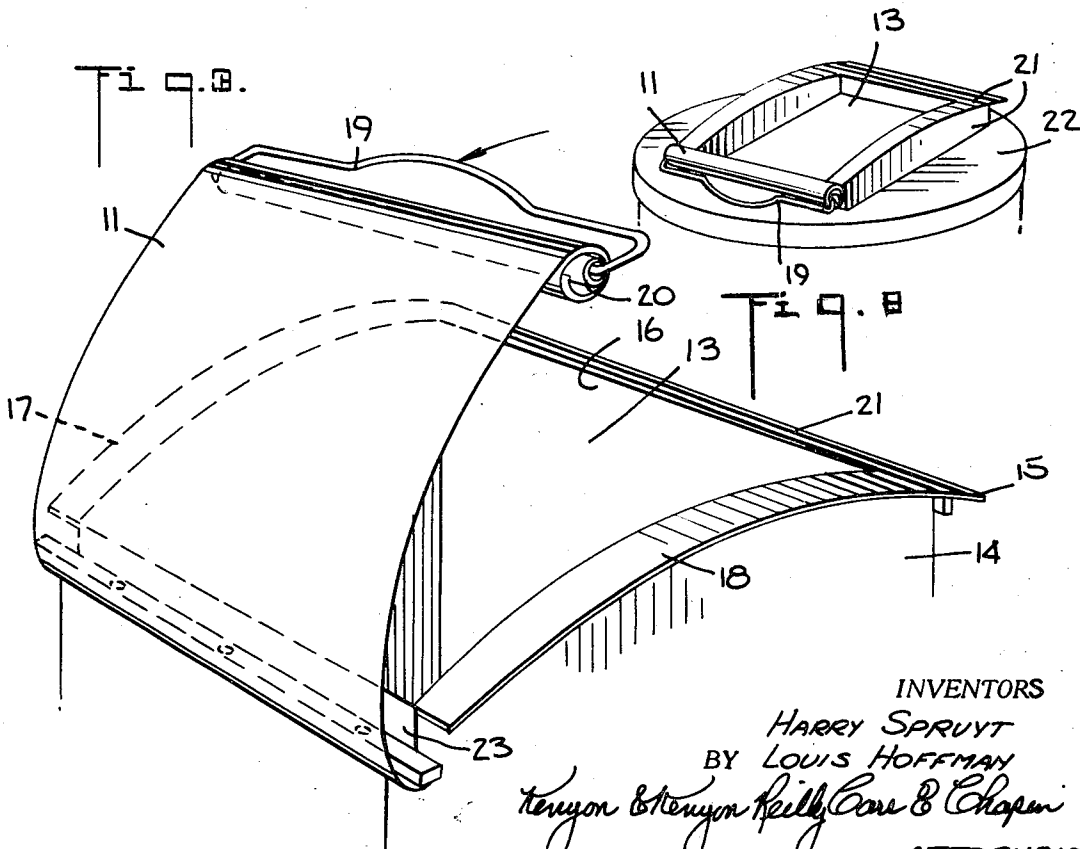
Spruyt et al.

[45] **Aug. 29, 1972**

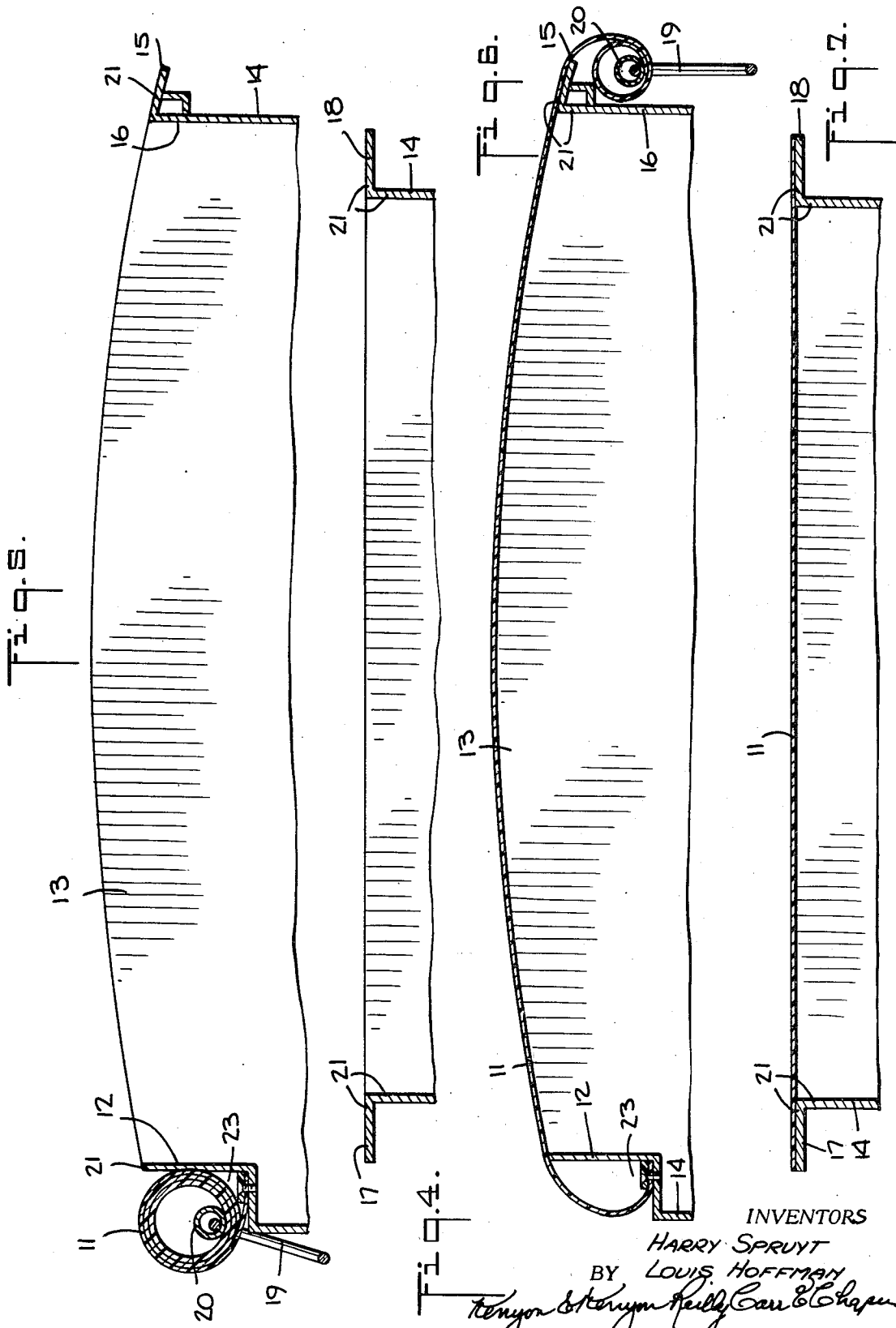
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10 Claims, 8 Drawing Figures





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SELF-RETRACTING COVER**FIELD OF THE INVENTION**

This invention relates to cover devices and more particularly to a self-retracting cover device for an opening or port. When closed, the cover provides a firm protective closure around the edges of the opening. When opened, the cover automatically retracts itself into a small, compact unit permanently attachable near the opening.

DESCRIPTION OF THE PRIOR ART

Prior art devices directed to flexible closures for ports or openings have been generally unsuitable for such outdoor storage containers as refuse containers or roadside sand cans. Such containers have typically employed hinged or removable rigid covers. Where considerable abuse is to be encountered, as for example in refuse containers, the impracticality of prior art self-retracting flexible closure devices has been quite apparent. This is especially true since firm and reliable closure over the contents in such cases is usually quite highly desirable.

Prior art covers for refuse containers have been unsatisfactory basically for the reasons that they are removable from the container and are formed from rigid metal. Thus such covers during removal and replacement with respect to the container are invariably quite noisy. Being unattached to the container, such covers are readily lost and damaged.

In prior art devices directed to flexible closures for ports or openings, the efficacy of the closure has not generally been a result of the inherent properties of the material intended to cover the opening. Rather, separate means such as springs or guide rails have been provided in order to impart a closing tension to the flexible material or to direct and hold it in the proper path over the opening. The common window shade provides an example of a spring driven device. U.S. Pat. No. 1,062,277 (Guricke), issued May 20, 1913, discloses a typical device wherein guide rails or tracks are used to direct and hold the flexible cover in the correct position over the opening. When it was desired to use such a flexible closure, therefore, it was frequently necessary to provide such mechanical winding or tensioning devices, such special guide means, or both.

The prior art also discloses the use of flexible self-coiling materials placeable over openings and serving there as loose barriers. The principle advantages of the use of such materials in those applications has been their convenient self-storing properties. One such device is shown in U.S. Pat. No. 3,241,899 (Donker), issued Mar. 22, 1966. In this device a self-coiling material is draped at night over a grocery store food freezer opening to reduce spillage of cold air therefrom. This device is not, however, directed to containers such as refuse or sand containers. The edges of the cover material are not supported, and the device is not directed to providing the type of sealing fit desired in such containers.

SUMMARY OF THE INVENTION

It is therefore an object of this invention to provide a self-retracting cover for an opening in a container which will not require separate means to effect the retraction thereof.

It is another object of this invention to provide a self-retracting cover device wherein the retracting force and the closure force are provided by the flexible covering material.

It is still another object of this invention to provide a firm and reliable closure without the need for specially grooved tracks or other complicated retention and guiding devices.

It is a further object of this invention to provide a cover device which may be unobtrusively, permanently, and protectedly attached near the opening.

It is also a further object of this invention to provide such a self-retracting cover device which is free of offensive noise and clatter when being operated.

It is a still further object of this invention to provide such a device which at the same time is easily and reliably operable.

BRIEF DESCRIPTION OF THE PREFERRED EMBODIMENT

Briefly, one embodiment of this invention includes a self-coiling flexible sheet material attached near the opening which is to be covered. The opening itself extends through the faces of a frame. The exterior face of the frame has an arcuate curvature which curves outwardly with respect to the exterior of the container, such that when the self-coiling sheet material is drawn over the opening, the sheet material wraps around this curvature and generates a downward vector force against the perimeter of the opening. In this way there is created a firm seal against all edges of the opening. A handle and roller are provided through the coiled sheet material for ease in controlling the material when pulling it over the opening or releasing it. An overhanging lip disposed opposite the attachment of the cover sheet to the frame provides a ledge around which the self-coiling sheet material may wrap when the device is closed, thus employing the self-coiling property of the cover sheet to retain the sheet material in its closed position.

BRIEF DESCRIPTION OF THE DRAWINGS

Other objects and purposes of this invention will become apparent from the following detailed description and drawings in which:

FIG. 1 is a perspective view of an embodiment of this invention as applied to a rectangular container, showing the self-retracting cover in the open position;

FIG. 2 is a perspective view showing the self-retracting cover of the embodiment of FIG. 1 in the closed position;

FIG. 3 is an enlarged fragmentary perspective view showing the self-retracting cover mid-way from its closed to its opened position;

FIG. 4 is a vertical section view taken along line 4 — 4 in FIG. 1 and showing the opening and two oppositely disposed sides of the frame for the cover;

FIG. 5 is a vertical sectional view taken along line 5 — 5 in FIG. 1, showing the opening and showing the retracted cover in a protective recess adjacent one side portion thereof;

FIG. 6 is a vertical section view taken along line 6 — 6 in FIG. 2 and showing the cover in the closed position with the cover material wrapped around the overhanging retaining lip;

FIG. 7 is a vertical section view taken along the line 7 — 7 in FIG. 2 and showing the cover material engaging the sides of the frame in the closed position; and

FIG. 8 is a perspective view of an embodiment of the invention applied to a portion of a round container.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

As may be seen in the FIG. 1, the device of this invention includes a self-coiling sheet or cover material 11 attached at one side 12 of an opening 13 in a container 14, the cover sheet material 11 being drawable over the opening 13.

The cover sheet material 11 is of resiliently flexible material capable of receiving a permanently set coil. One such material is Mylar, a plastic which may receive such a permanent set by first rolling the sheet into the desired coil, heating it until near the melting point, and then cooling it while it is still in the coiled condition, thus setting the coil into the sheet.

An overhanging lip 15 is provided on the side 16 of the opening 13 opposite the side 12 to which the cover sheet material 11 is attached. The overhanging lip 15 serves as a convenient fastening means or retention device whereby the cover sheet material 11 is held in its extended position when the self-retracting cover of this invention is closed, as in FIG. 2. As may be seen in FIG. 2 and more particularly in FIG. 6, the sheet material 11 coils up tightly around and beneath the overhanging lip 15 when the cover is in the closed position. This mode of retention, wherein the sheet material 11 coils freely and tightly around the lip 15, also imparts a tension to the sheet material 11 covering the opening 13, which tension, as will be seen, strongly enhances the efficacy of the closure.

The frame 21 has two faces thereon, the faces being between sides 12, 16, 17, and 18, with the opening 13 passing through these faces. The exterior face of the frame defines an arcuate surface having a curvature which curves outwardly with regard to the exterior of the container 14. In the preferred embodiment the curve extends generally along sides 17 and 18, extending from the side 12 at which the cover sheet 11 is attached to the opposite side 16 thereof. By way of example, a curve or curvature in one dimension can be seen in FIGS. 4 to 7 wherein the intersections along lines 4 — 4 of FIG. 1 and 7 — 7 of FIG. 2 reveal a straight line, while the intersections along lines 5 — 5 of FIG. 1 and 6 — 6 of FIG. 2 show the outward curvature in the other dimension, as described.

The self-coiling sheet 11 is oriented so that the axis around which the self-coiling sheet material 11 tends to coil is generally perpendicular to the sides showing the greatest curvature. Thus in the preferred embodiment this axis is perpendicular to sides 17 and 18 of the opening 13, since sides 17 and 18 show the greatest curvature. The sheet material 11, following the curvature of sides 17 and 18, and hence the curvature of the opening 13, wraps itself about the edges of the opening 13. The sheet material 11 is thus caused to describe an arcuate curve over the path from the side 12 of the opening to which it is attached to the side 16 where it is releasably held when in the closed position. As a result of this construction the force of the natural coiling tendency of the sheet means 11 combines with the tension

generated by the coiling of the end of the sheet means 11 around the lip 15 to generate a downward vector force in the sheet means 11 against the curved sides 17 and 18 of the opening 13. A firm and reliable closure around the entire perimeter of the opening 13 in frame 21 is thus provided.

A handle 19 is provided around which the self-coiling cover sheet material 11 is enabled to wind. A roller 20 can be provided in the coil of the sheet means 11 and disposed about the handle 19. By this means the self-retracting cover device of this invention may be easily operated, as may be seen in FIG. 3 where the handle 19 is being used to open the cover in the direction of the arrow, and the sheet material 11 is wrapping around the roller 20.

The opening 13 which defines the inner perimeter of the arcuate surface may have other forms than the rectangular shape depicted in the figures. Openings or apertures of almost any desired shape can easily be accommodated by this invention.

FIGS. 3 and 5 illustrate a recess 23 at the side 12 where the sheet means 11 is permanently attached. This recess 23 serves to protect the cover sheet 11 when in the open position.

Where it is desired to attach the self-retracting cover device of this invention to an existing opening or container, FIG. 8 shows one means whereby this may conveniently be accomplished. In this embodiment the same features are provided as hereinabove described, and in addition the frame 21 is attached to a supporting cover 22 which is adapted to be attached to the existing container opening.

The use of the plastic sheet means 11 also results in a low noise profile for this invention. This makes it particularly desirable in such applications as refuse containers where noisy closure devices may prove highly objectionable. Another advantage, particularly where refuse containers are involved, is that this self-retracting cover device may be permanently but protectedly attached to the container so that it never becomes lost and so that the risk of damage is low.

What is claimed is:

1. A self-retracting cover means for a container which has an open portion connected to the interior thereof, the cover means comprising:

a frame member having oppositely disposed side portions spaced apart from one another and extending adjacent to opposite edges of an opening formed therebetween, each of the side portions having a face curved both outwardly along at least a portion of its length and away from the open portion of the container when the cover means is mounted thereon, corresponding points along each of the faces being substantially tangential to a common plane;

a self-coiling sheet means adapted to overlies and cover the opening and to overlies and engage the faces of the side portions of the frame member, the self-coiling sheet means having one end portion thereof connected to said frame member adjacent an edge of the opening therein and an end portion of each of the side portions thereof; and

fastening means for releasably fastening the self-coiling sheet means to the frame member adjacent another edge of the opening and the other end por-

tion of each of the side portions opposite, respectively, said edge of the opening and said end portions of the side portions,

whereby the self-coiling sheet means is enabled to coil about itself and retract away from the opening in the frame member when in the open position, and whereby said self-coiling sheet means is enabled to be engaged with the faces of the side portions of the frame member and to cover the opening therein when the cover means is held in the closed position thereof by the fastening means.

2. A self-retracting cover means in accordance with claim 1 in which each of said faces curved outwardly along at least a portion of the length of the side portions of the frame member and away from the open portion of the container when the cover means is mounted thereon comprises an elongated narrow web, corresponding points along the surface of each of said webs being substantially tangential to a common plane, whereby the surfaces of said webs are adapted to form a sealing engagement with the surface of the self-coiling sheet means adjacent thereto when the sheet means is in the closed position thereof.

3. A self-retracting cover means in accordance with claim 1 in which the opening formed in the frame member between the oppositely disposed side portions thereof is substantially rectangular.

4. The self-retracting cover means of claim 1 wherein the self-coiling sheet means comprises self-coiling sheet plastic material.

5. A self-retracting cover means in accordance with claim 1 in which the surface of said self-coiling sheet means which faces the central axis of the self-coiling sheet means when in its coiled condition is the surface thereof which engages the faces of the side portions of

the frame member when the self-coiling sheet is in its closed position.

6. A self-retracting cover means in accordance with claim 1 and further comprising a handle means having an elongated portion thereof extending through the self-coiling sheet means along the central axis of the coil thereof, whereby the sheet means may be moved from one of the closed or the open position to the other by applying force to said handle.

7. A self-retracting cover means in accordance with claim 6 in which said elongated portion of said handle means comprises a roller extending through the self-coiling sheet means.

8. A self-retracting cover means in accordance with claim 1 in which the fastening means comprises an overhanging lip extending away from the opening and connected to said frame member adjacent said other edge of the opening therein, whereby the portion of said sheet means extending beyond said overhanging lip, when said cover means is in the closed position, is enabled to coil around said lip to retain said cover means in the closed position.

9. A self-retracting cover means in accordance with claim 1 and further comprising a supporting member having an aperture therein substantially corresponding in form to the opening of said frame member said supporting member being engaged to said frame member with the opening is said frame member being substantially aligned with said aperture, whereby said supporting member is adapted to support said cover means upon a container.

10. A self-retracting cover in accordance with claim 9 in which said supporting member comprises a plate of a form substantially corresponding to that of the open portion of the container.

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