Oct. 13, 1959 H. S. JEWELL 2,908,326

ROLL-UP WINDOW COVERING DEVICE

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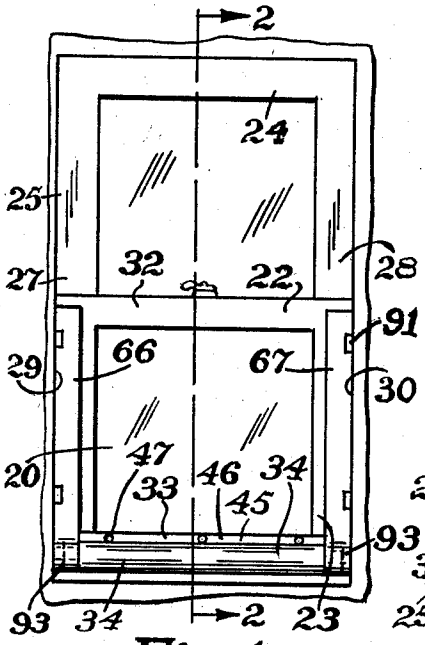


Fig. 1.

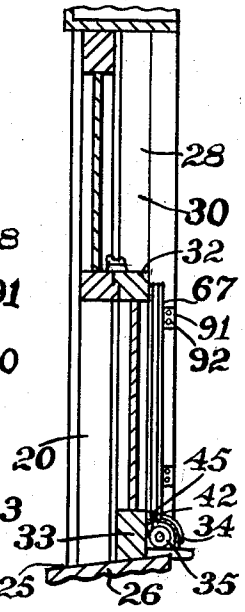


Fig. 2.

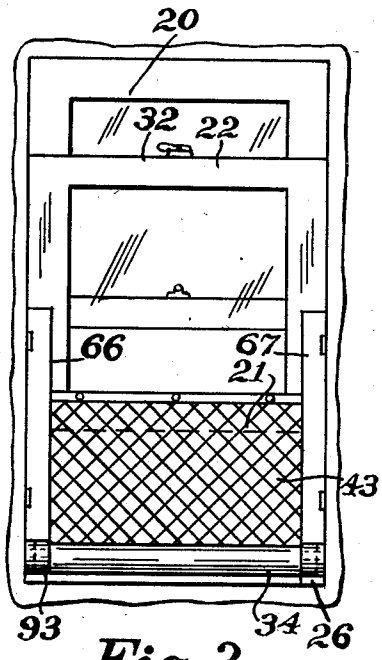


Fig. 3.

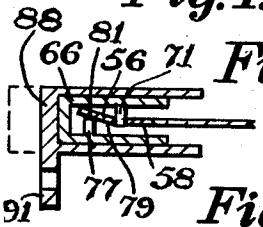


Fig. 4.

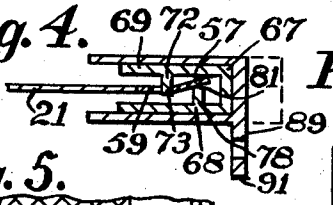


Fig. 5.

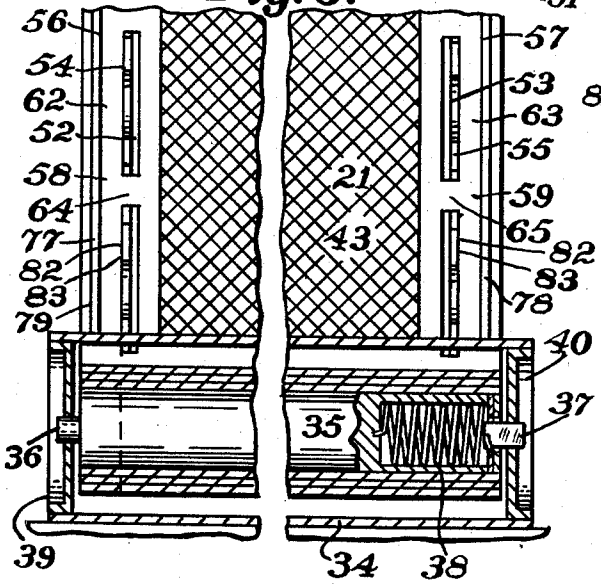
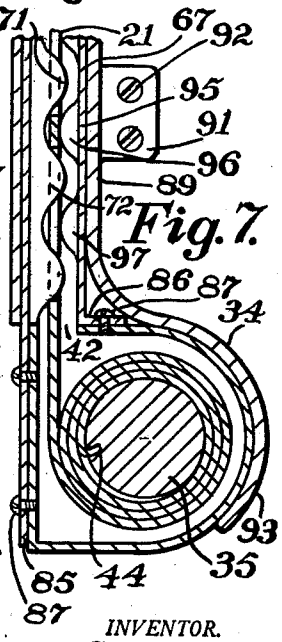


Fig. 6.



Fig. 7.



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ROLL-UP WINDOW COVERING DEVICE

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11 Claims. (Cl. 160—31)

This invention relates to rollup coverings for openings and especially to rollup screens for window openings.

Flexible coverings over openings have long been mounted on spring operated rollers, whereby they may be unwound across the opening or wound on the roll when not in use. When the covering is intended to be light proof or insect proof, however, it has been difficult to seal the longitudinal or side edges of the covering to the corresponding edges of the opening. In addition, such coverings must usually be taut when unwound and not acquire unsightly bulges under impact of a blow or of the wind.

It has heretofore been proposed to provide an enlarged continuous bead or a line of spaced protuberances along the side edge of such flexible coverings, which enter a slotted guide and are intended to hold the covering taut. However, difficulties arise in rolling up such enlargements on the ends of the covering, the ends becoming bulky and the covering becoming pierced, folded or otherwise unattractive during use.

It has also been proposed to provide a single row of spaced perforations on each side edge of the covering, the perforations being intended to engage over a single line of pins during unwinding. Such a structure is disclosed in U.S. patent 549,495 to Crocker of November 12, 1895, now patent No. 2,827,253 issued March 18, 1958 and the roll is movable with the sash rather than being fixed to the window frame to permit the perforations to engage and disengage from the pins.

The principal object of this invention is to provide a rollup window covering device that may be fixed across the opening to be covered, that automatically grips the side edges of the covering as it is unwound over the opening and that permits the covering to be wound up in a tight smooth roll.

Another object of the invention is to provide a rollup window screen with means for automatically sealing the side edges thereof which means does not increase the diameter of the roll and requires no moving parts along the edges of the opening.

A further object of the invention is to provide a roll-up window screen assembly including a casing and a pair of side supports adapted to hold the screen tautly between the supports, the assembly being adapted to fit window openings of different widths within a predetermined range.

Still another object of the invention is to provide a stationary toothed rack having spaced teeth arranged to engage in spaced elongated slots along the edge of a flexible rollup screen, the narrow webs between the slots riding over the tips of the teeth to permit sliding engagement.

A still further object of the invention is to provide a rollup screen for windows which remains taut and insect tight when unwound and yet rolls up into a compact cylinder within a casing fixed to the window sill.

Other objects and advantages of the invention will

be apparent from the claims, the description of the drawing and from the drawing in which

Fig. 1 is a front elevation of the device of this invention in place on the inside of a window.

Fig. 2 is a side view in section on line 2—2 of Fig. 1.

Fig. 3 is a view similar to Fig. 1 showing the roll-up screen and lower sash partly raised.

Fig. 4 is an enlarged fragmentary plan view of the side supports of the rollup screen.

Fig. 5 is an enlarged fragmentary front elevation, in section, showing the rollup window covering assembly of the invention.

Fig. 6 is an enlarged side elevation of the preferred form of support, toothed rack and guide bar of the invention and

Fig. 7 is a view similar to Fig. 6 showing a modified form of support.

In the drawing, **20** represents a typical opening desired to be covered and uncovered by a sheet of flexible window covering material **21**. In the embodiment shown, opening **20** is coextensive area-wise with the lower sash **22** of a window **23** having the usual upper sash **24** and frame **25**. Sheet **21** is a meshed screen but may be of opaque, unperforated material to serve as a blackout screen or of transparent, unperforated material to serve as a storm window.

Frame **25** includes the sill **26** and the opposite side members, or stiles, **27** and **28** each having an inside face **29** and **30** respectively. Lower sash **22** includes top rail **32** and lower rail **33** and is slideable upwardly, as shown in Fig. 3, in the usual manner.

In its preferred form the device of this invention includes a hollow casing **34** which may be of square or rounded cross section and adapted to extend laterally across the opening **20**. A roller **35**, having stub shafts **36** and **37** and a coil spring **38** is mounted to rotate in the inwardly dished end caps **39** and **40** of casing **34**, and a narrow slot **42** extends laterally of casing **34** coextensive with roller **35**.

The flexible sheet **21** is meshed at **43** and preferably is of synthetic plastic material rather than crossed metal wires because such plastic screening rolls up easily without permanent deformation of the sheet. One lateral edge **44** of sheet **21** is affixed in any suitable manner to the roller **35** and the other lateral edge **45** is affixed to the lower rail **33** of lower sash **22**. A rigid strip **46** extending along rail **33** and having suitable holes for screws **47** may be used to permanently affix cage **45** to rail **33** as shown or the strip may be detachably hooked onto rail **33** in any convenient manner which creates an insect proof seal therealong.

The sheet **21** extends through the slot **42** in casing **34** and when the lower sash **22** is in downward position the spring **38** causes the sheet to be wound up on the roller **35**. Upon raising the sash **22**, sheet **21** is unwound from roller **34** through slot **42** to cover the opening **20**.

A pair of lines or series **52** and **53** of spaced identical perforations such as **54** and **55** are provided along each opposite, longitudinally extending edge portion **56** and **57** of the sheet **21**. When the sheet **21** is of flexible screen mesh material it is preferred that the edge portions **56** and **57** be strengthened as best shown in Fig. 5. It is not desirable to strengthen the same by increasing thickness because such thickness disadvantageously affects the rollup characteristics of the screen.

Wire screen material when used is preferably formed with a selvage edge of increased density of strands adapted to form strong relatively imperforate edge strips such as at **58** and **59**. Plastic screen material may be heat treated to cause the strands along the selvage to flow and fuse together, thereby forming imperforate

strong edge strips such as at 58 and 59. Additional strands of plastic material may also be woven or otherwise applied to the selvage edges of plastic material to be fused by heat into strong edge strips. Preferably the oppositely disposed longitudinal strips 58 and 59 while unmeshed and reinforced are still as flexible as the meshed portion of the sheet and of a uniform thickness no greater than the thickness of the said meshed portion.

The strips 58 and 59 are preferably about one half inch in width and the lines 52 and 53 are each preferably on the inside of the longitudinal centre line of the strip to leave an unslotted continuous band such as 62 and 63 on the outside of the said centre line. Each perforation such as 54 and 55 is preferably an elongated slot about one and one quarter inches in length and one eighth inches wide there being narrow webs such as 64 and 65 each about a quarter inch in length, between each adjacent pair of slots. The above dimensions are not intended to be limiting but are for the purpose of specifying a particular slot and web configuration that has been found to accomplish the purpose of the invention in a satisfactory manner.

A pair of side supports 66 and 67, preferably of rigid material are provided, each substantially coextensive longitudinally with the opening to be covered such as opening 20. Supports 66 and 67 are identical but reversed. Each support such as 67 is preferably unitary and of U-shaped cross section as best shown in Fig. 4 and the opposite legs 68 and 69 of each support are arranged to embrace or straddle the adjacent strip 59 of the sheet 21.

A longitudinally extending stationary toothed rack, or rib, such as 71 or 72 is provided on each support 66 or 67, the rack having spaced identical teeth such as 73 and 74 projecting from a leg 69, inwardly toward sheet 21. The teeth such as 73 and 74 are separated by spaces 75 in which the webs 64 and 65 may be accommodated and the teeth form an undulated path aligned with the perforations 54 and 55 and adapted to slideably support the webs 64 and 65. Preferably the distance between the centre points of each adjacent pair of teeth is about three quarters of an inch and the teeth are about half the width of the perforations 54 and 55 or about one sixteenth inch wide. As best shown in Fig. 6 the tips such as 76 of the teeth of each rack 71 or 72 are in a plane beyond the central plane of the support and the slot 42 is aligned with the said central plane.

Each support 66 and 67 includes a guide bar, such as 77 or 78, oppositely disposed to, and laterally displaced from, the toothed rack 71 or 72 of the support. Each guide bar such as 78 projects inwardly from a leg such as 68 of a support 66 or 67 toward the adjacent face 79 of the sheet 21 and includes a longitudinally extending terminal or outer face 81 extending beyond the central plane of the support and overlapping the teeth of the adjacent rack 72. The guide bars 77 and 78 are spaced laterally outside the racks 71 and 72 by about one quarter of an inch whereby they slideably engage the unperforated bands 62 and 63 of strips 58 and 59 and urge the perforations 54 and 55 toward and onto the teeth 73 and 74 while permitting the webs 64 and 65 to ride over the teeth.

The edge strips 58 and 59 are thus distorted while sliding longitudinally in stationary supports 66 and 67 and each slot or perforation is always engaged on at least one tooth of the racks. The slots are wider than the teeth to assure a slip-over engagement and a portion of the outer edge 82 of each slot is continuously caught behind the outer face 83 of at least one tooth. It will be obvious that when fabric curtains or the like are used as window covering material additional lines of teeth and bars can be used, although a single rack and bar has been found to function adequately.

As best shown in Fig. 7 preferably the supports 66 and 67 each include extensions 85 and 86 detachably fixed by screws 87, bolts welding or adhesive to an adjacent outside wall of the casing 34. Thus the narrow slot 42 for the sheet 21 is always aligned with the central longitudinal plane of the supports, the lines of perforations 52 and 53 are always aligned with the toothed racks 71 and 72 and the bands 62 and 63 are always aligned with the guide bars 77 and 78. Preferably the casings 34, rollers 35 and sheets 21 are manufactured in a plurality of standard lengths to fit standard window widths. For example, a 20 inch long casing might be used in a 21 inch wide window and novel means are provided for adjusting the mechanism to the window.

As best shown in Figs. 4 and 7 each support 66 and 67 is provided with laterally telescopable means comprising a U-shaped sealing channel 88 or 89 of rigid material and adapted to slideably embrace the support. Each channel such as 88 includes continuous or interrupted right angular integral flanges such as at 91 whereby it may be detachably fixed to the adjacent inside face 29 or 30 of the stiles 27 and 28 by wood screws 92. Each channel 88 or 89 also includes a curved lower terminal portion 93 arranged to slideably fit around the adjacent end portion of the casing 34. Thus the casing 34 and supports 66 and 67 may be centred in a window opening 20 and the channels 88 and 89 slid outwardly to fill the entire opening and make the assembly insect proof. In addition the channels 88 and 89 maintain the supports 66 and 67 and casing 34 in position and permit the withdrawal of the same by the unfastening of a single element such as 88. The curved lower portion 93 is preferably resilient in order that the casing is held therein with a spring clamping action.

As shown in Fig. 7 instead of a flat faced guide bar such as 77 and 78, a guide bar 95 having spaced teeth may be used. The teeth such as 96 and 97 of rack 95 are arranged opposite the spaces between the teeth of the racks such as 71 and 72 and the tips thereof serve the same purpose as the face 81 of bars 77 and 78. However, the webs 64 and 65 travel a more undulated path and the meshing and unmeshing of the slots is even more positive than with a flat face.

I claim:

1. A rollup window covering device, said device comprising a spring roller adapted to be rotatably mounted in fixed position laterally across the frame of a window; a sheet of flexible window covering material wound on said roller and adapted to extend longitudinally of said window when unwound; said sheet having a line of spaced, identical perforations along each opposite longitudinal edge portion; a pair of longitudinally extending supports each adapted to be fixed on an opposite side of said window frame, each said support having a stationary, toothed rack longitudinally aligned with the adjacent line of said perforations, the teeth of said rack forming an undulated path and being arranged to mesh in said perforations from one face of said sheet as it is unwound and each said support having a guide bar, oppositely disposed to, and laterally displaced from, the toothed rack of said support, each said bar being adapted to engage the other face of said sheet proximate said line of perforations during unwinding of said sheet to urge said perforations toward and onto the teeth of said toothed racks.

2. A combination as specified in claim 1 wherein said perforations are elongated slots separated from each other by relatively narrow webs of said sheet material, each two adjacent teeth of said rack are spaced to both fit within a single slot and said webs are adapted to fit in the space between each two adjacent teeth.

3. A combination as specified in claim 1 wherein said guide bar includes spaced teeth forming an undulated path, each tooth being opposite the space between two adjacent teeth on said toothed rack.

4. A combination as specified in claim 1 wherein each said perforation is a slot extending longitudinally at least twice the length of each web between adjacent slots and

extends longitudinally a distance greater than the distance between the centres of two adjacent teeth of said rack whereby a portion of each slot is engaged outside one of said teeth at all times said sheet is unwound.

5. A combination as specified in claim 1 wherein each said perforation is an elongated slot of greater lateral and longitudinal dimension than a single tooth of said rack and a portion of the outside edge of each slot is on the outside face of one of said teeth at all times said sheet is unwound.

6. A combination as specified in claim 1 wherein said sheet of window covering material is meshed except for oppositely disposed longitudinal unmeshed and reinforced flexible strips of uniform thickness equal to the thickness of said sheet and said lines of spaced identical perforations are wholly within said strips.

7. A combination as specified in claim 1 plus a casing for rotatably supporting said roller, means for detachably fixing said supports at opposite ends of said casing with said toothed racks aligned with the perforations in said sheet and laterally telescopable means embracing said supports for mounting said casing and supports in a window opening.

8. A combination as specified in claim 7 wherein said laterally telescopable means comprises a pair of channels each adapted to slideably embrace one of said supports to take up the space between the outside edge of said supports and the inside face of the window frame and each having right angular flange means for attaching the same to said inside faces.

9. A combination as specified in claim 7 wherein each said support includes an extension adapted to overlie an adjacent outside wall of said casing and detachable threaded means for affixing said extension to said walls.

10. A spring roller type window screen device mounted in a casing said device comprising a flexible meshed screen

wound on said roller within said casing and having a line of identical elongated slots along each opposite longitudinal edge portion thereof and a pair of longitudinally extending rigid supports, coextensive with the window opening to be screened and mounted on said casing, each said support having a stationary undulated rib forming a line of teeth adapted to engage said slots and an oppositely disposed bar overlapping the tips of the teeth of said rib and at a spaced lateral distance outside said rib for urging said slots onto said teeth when said screen is unwound.

11. Apparatus for maintaining a flexible sheet in taut condition while being slid across an opening, said apparatus comprising a reinforced edge strip along opposite sides of said sheet each strip having a straight line of spaced, identical, elongated slots therein and a pair of straight, parallel rigid supports, each extending in the path of said edge strips and coextensive with said opening, each said support having a straight line of spaced identical stationary teeth forming an undulated path and adapted to enter said slots and a straight rigid bar coextensive with said line of teeth but laterally displaced therefrom and adapted to engage said strip to force said slots toward and onto said teeth as said sheet is slid along said supports.

References Cited in the file of this patent

UNITED STATES PATENTS

484,978	Rich	Oct. 25, 1892
573,803	Ackley	Dec. 22, 1896
843,061	Baker	Feb. 5, 1907
1,042,805	Lovell	Oct. 29, 1912
1,217,561	Bunnell	Feb. 27, 1917

FOREIGN PATENTS

192,809	Switzerland	Nov. 16, 1937