SAFETY COVER FOR A STORAGE BAY

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Rights and left columns are attached to vertical side supports of a standard storage bay containing multiple horizontal storage platforms. A biased cable moves over a pulley within the columns connected by a shaft driven by an electric motor. A vertical slot in an inside wall of the columns receives multiple slide blocks clamped to the cable at one end and connected to a clip on another end. The clip is attached to a side edge of a heavy duty curtain that moves up or down upon actuation of the motor.
SAFETY COVER FOR A STORAGE BAY

BACKGROUND OF THE INVENTION

[0001] This invention relates to storage bay safety covers. More particularly, it refers to a safety cover mounted on a side frame of a storage bay for vertical movement.

[0002] Many warehouse sales are now available for retail customers in larger facilities such as provided by COSCO, SAMS, HOME DEPOT and LOWES. These facilities typically have multi-level storage shelves on vertical support frames. The shelves are stacked with goods at all levels. Many accidents have been caused by the movement of goods on these shelves, particularly the higher shelves since the support frames usually separate customer aisles. When goods are removed from a high shelf from one aisle, items can fall from the other end of the shelf to the adjacent aisle. Safety covers to protect customers in adjacent aisles from falling objects from the high shelves have been employed. U.S. Pat. Nos. 4,981,225; 5,170,829; 5,573,125; 6,619,490 and 6,698,694 show attempts to provide safety nets for warehouse shelves to protect against falling objects. Although the systems described in these patents assist in providing safety to customers, many of these systems are expensive, hard to mount to a storage bay and are difficult to operate. A need exists for a storage bay safety cover that is easy to mount to a storage bay, provides protection against shifting articles on the storage bay shelves and is easy to operate.

SUMMARY OF THE INVENTION

[0003] This invention solves this problem by providing an easily mountable and operable safety cover apparatus that prevents shifting of articles in a storage bay from falling off its shelves and injuring customers or employees. The safety cover apparatus of this invention has a right and left hollow column attached to a corresponding right and left vertical support frame on a standard storage bay having multiple storage platforms. A biased cable moves over a pulley within the right and left hollow columns. An electric motor turns a shaft attached to the pulleys to retract the cables. Multiple slide blocks move vertically in a vertical slot on the inside wall surface of the right and left columns and are attached to the cables. Clips along a right and left edge of a heavy duty curtain attach to the slide blocks. A rod is positioned at a bottom edge of the curtain and has ends attached to slide blocks. As the slide blocks move upwardly upon retraction of the cable the curtain is likewise retracted and is lowered as the slide blocks move downwardly to cover one or more openings in the storage bay.

BRIEF DESCRIPTION OF THE DRAWINGS

[0004] The invention can be best understood by those having ordinary skill in the art of safety covers for storage bays by reference to the following detailed description when considered in conjunction with the accompanying drawings in which:

[0005] FIG. 1 is a perspective front view of the safety cover of this invention.

[0006] FIG. 2 is a perspective front view of a fully extended safety cover mounted to a storage bay.

[0007] FIG. 3 is a perspective front view of a partially extended safety cover mounted to a storage bay.

[0008] FIG. 4 is a perspective front view of a retracted safety cover mounted to a storage bay.

[0009] FIG. 5 is a partial perspective front view of the actuating switch for the safety cover.

[0010] FIG. 6 is a partial perspective front view of the connection between the cover and side column.

[0011] FIG. 7 is an exploded view of the cable system bottom portion within the side column shown in FIG. 6.

[0012] FIG. 8 is an exploded view of the drive mechanism attached to the top portion of the cable pulley system.

[0013] FIG. 9 is an exposed view of the drive components mounted in an overhead housing.

[0014] FIG. 10 is a perspective view of an alternate drive mechanism employing a hand crank.

DETAILED DESCRIPTION OF THE INVENTION

[0015] Throughout the following detailed description, the same reference numerals refer to the same elements in all figures.

[0016] Referring to FIG. 1, the safety cover apparatus 10 has a right 12 and left 14 vertical hollow column and a top drive housing 16. A heavy duty curtain 18 is attached along a right 20 and left 22 side edge to multiple clips 24 which are in turn connected to a slide block 26. The right 12 and left 14 vertical columns are attached with a bracket 28 to a corresponding front right 30 and left 32 vertical frame member supporting horizontal shelves 34, 36, 38 and 40, as seen in FIGS. 2-4. The right 12 and left 14 vertical columns could be attached to the right rear 42 or left rear 44 vertical frame member depending on which side of the storage bay protection is needed. Of course, the safety cover apparatus 10 could be mounted on both the front and rear portions of the storage bay as needed. Generally, it is only necessary to cover the top two shelves 38 and 40 as shown in FIG. 2. The curtain 18 can contain indicia (not shown) to advertise products for sale.

[0017] Referring to FIGS. 6-7, vertical column 12 has a vertical slot 46 along an inside wall 48. The slide blocks 26 have grooves 50 and 52 overlapping edges 54 and 56, respectively along slot 46. Each slide block 26 is attached along its back wall 58 to cable 60 by a pair of clamps 62 and 64. A U-bolt 66 is threaded to nuts 68 and 70 over clamp 64. A U-bolt 66 is attached within groove 72 to rod 74. Rod 74 is attached within a folded up lower portion 76 of curtain 18.

[0018] Lower pulley 78 is bolted to a lower inner wall 80 of column 12 with a flange bearing 82 interposed between a side of the pulley 78 and the inner wall 80.

[0019] Referring to FIG. 8, the upper pulley 84 is bolted to the upper inner wall 86 of column 12 with a flange bearing 82 interposed between a side of the pulley 84 and the inner wall portion 86. The cable 60 is kept under tension with spring 88. A limit switch prevents any cable override. The upper pulley 84 is turned by drive shaft 92, driven by motor 94 as shown in FIG. 9. A right side drive shaft bracket 96 is attached to an inner wall of housing 16 to support the drive shaft 92. A motor pulley 98 turns the drive shaft 92 which
is supported on the left side within housing 16 by drive shaft bracket 100. Drive shaft bracket 100 is bolted to an inner wall of housing 16.

[0020] The motor 94 is electrically operated by a switch 102 which is bolted to a vertical frame member 30. Wire 104 connects to motor 94. Alternatively, as seen in FIG. 10, the pulleys can be operated by a hand crank 106.

[0021] The housing 16 and vertical hollow tubular columns 12 and 14 are made of aluminum or steel. The curtain 18 is a synthetic nylon, or polyester fabric, or natural fabric cloth or other high strength material on which indicia can be printed for advertising purposes.

[0022] Equivalent components can be substituted for the components described above to obtain substantially the same results in substantially the same way and achieve substantially the same function.

Having disclosed the invention, what is claimed, follows:

1. A retractable curtain guard for a storage bay having multiple levels separated by horizontal storage platforms and vertically spaced apart side supports attached on a first and second front and rear side of the storage platforms, the retractable curtain guard comprising:
   - a right and left hollow column attached to the first and second front or rear side supports;
   - a cable moving over a pulley within the right and left column;
   - a means for driving the pulley to release or retract the cable;
   - a vertical slot in an inside wall of the right and left column;
   - multiple slide blocks clamped to the cable and movable in a vertical direction within the vertical slot in the right and left column;
   - a heavy duty curtain positioned between the right and left column and attached on a first and second side edge to clips connected to the multiple slide blocks; and
   - a horizontal rod attached to a bottom edge of the curtain, a first and second end of the rod connected to a slide block so that upon actuating of the means for driving the pulley the curtain is either lowered to cover at least one entrance to a storage platform or retracted to expose the storage platforms.

2. The retractable curtain guard according to claim 1 wherein the means for driving the pulley is an electric motor turning a shaft connected to the pulley.

3. The retractable curtain guard according to claim 1 wherein the means for driving the pulley is a hand crank.

4. The retractable curtain guard according to claim 1 wherein the cable is biased.

5. The retractable curtain guard according to claim 1 wherein each slide block has oppositely positioned side grooves riding over oppositely positioned edges of the vertical slot in the right and left column.

6. The retractable curtain guard according to claim 1 wherein the right and left hollow columns are attached to the first and second front vertical side supports for the storage bay by bolted brackets.

7. The retractable curtain guard according to claim 1 wherein the right and left hollow columns are attached to the first and second rear vertical side supports for the storage bay by bolted brackets.

8. The retractable curtain guard according to claim 1 wherein the heavy duty curtain contains indicia.

9. The retractable curtain guard according to claim 1 wherein the heavy duty curtain is a nylon sheet.

10. A protective curtain apparatus for a storage bay having multiple levels separated by horizontal storage platforms and vertically spaced apart side supports on a first and second front and rear side of the storage platforms, the protective curtain apparatus attached by hollow right and left side columns to the vertically spaced apart side supports, the protective apparatus additionally comprising:
   - a biased cable moving over a pulley within the hollow side columns;
   - a means for driving the pulleys to release or retract the cable;
   - a vertical slot in an inside wall of the right and left hollow column;
   - multiple slide blocks clamped to the cable, the slide blocks movable in a vertical direction within the vertical slot in the right and left column;
   - a heavy duty curtain positioned between the right and left columns and attached by clips on a right and left side edge of the curtain to the slide blocks; and
   - a horizontal rod attached to a bottom edge of the curtain, a first and second end of the rod connected to a slide block so that upon actuating of the means for driving the pulley the curtain is either lowered to cover at least one entrance to a storage platform or retracted to expose the storage platforms.

11. A protective curtain apparatus according to claim 10, wherein the means for driving the pulleys is an electric motor turning a shaft attached to the pulleys.

12. A protective curtain apparatus according to claim 10, wherein the slide blocks have grooves on opposite side surfaces engaging an opposing edge on each side of the vertical slot.

13. A protective curtain apparatus according to claim 10, wherein the heavy duty curtain is a nylon sheet.

14. A protective curtain apparatus according to claim 13, wherein the nylon curtain contains indicia.

15. A method for the prevention of goods falling from multi-level storage platforms, the platforms having front and rear, right and left side vertical posts supporting the multi-level storage platforms, the method comprising:
   - attaching right and left hollow columns to the right and left side vertical post respectively, each column having a vertical slot along an inside wall;
   - attaching a pulley to a wall in the right and left hollow columns;
   - mounting a biased cable over the pulleys;
   - mounting an electric motor in a housing positioned above the right and left hollow columns;
driving the pulleys with a shaft turned by the electric motor;
clamping multiple slide blocks to the cable;
attaching multiple clips to a right and left side edge of a heavy duty curtain and connecting each clip to a slide block;
attaching a rod to a bottom edge of the curtain and connecting a first and second end of the rod to a slide block; and
activating the motor and the pulleys with a switch.

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