Oct. 11, 1966 M. A. KLEINBARD ETAL 3,277,498

SWIMMING POOL COVER ASSEMBLY

Filed Feb. 6, 1961 2 Sheets-Sheet 1

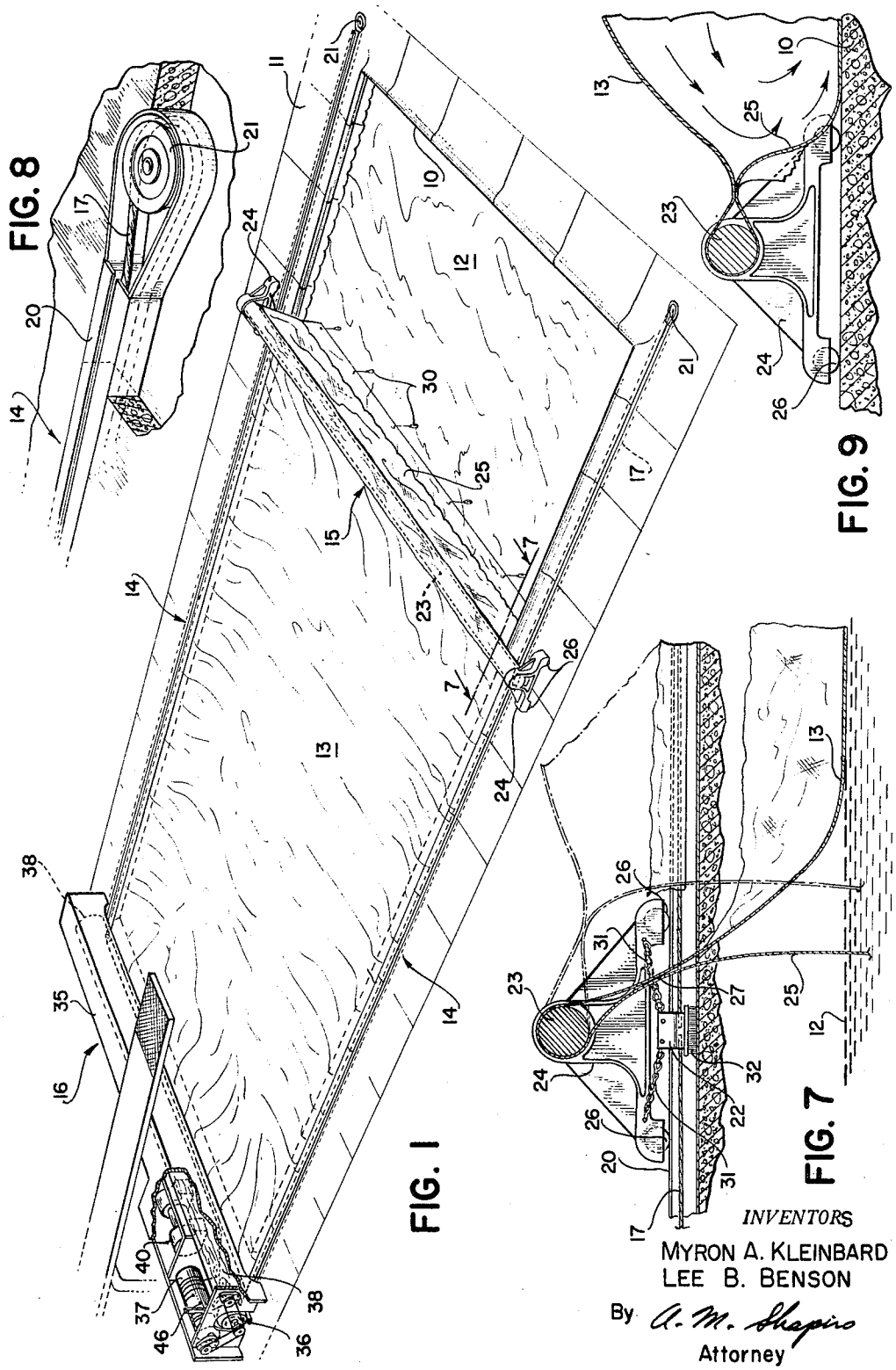


FIG. 1

FIG. 8

FIG. 9

FIG. 7

INVENTORS
MYRON A. KLEINBARD
LEE B. BENSON
By A. M. Shapiro
Attorney

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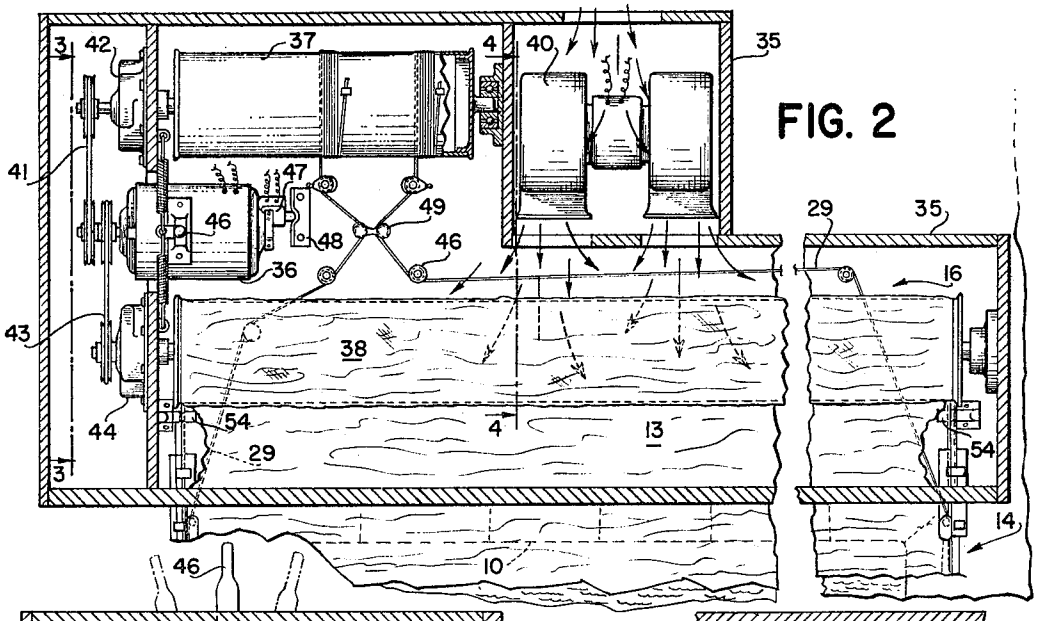


FIG. 2

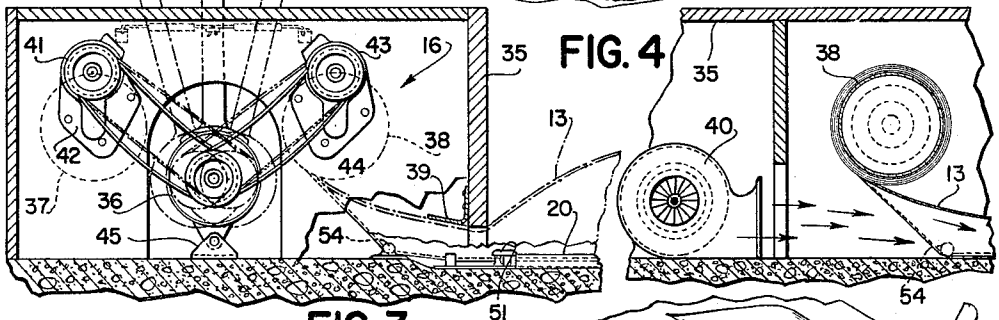


FIG. 4

FIG. 3

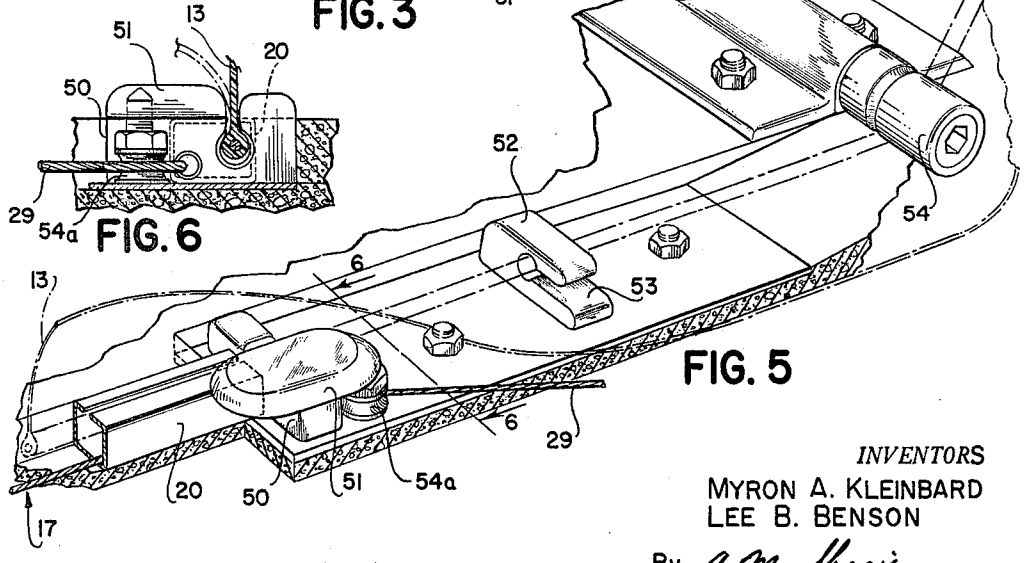


FIG. 6

FIG. 5

INVENTORS
MYRON A. KLEINBARD
LEE B. BENSON
By A. M. Shapiro
Attorney

United States Patent Office

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SWIMMING POOL COVER ASSEMBLY

Myron A. Kleinbard, 1450 S. Oakhurst Drive, Los Angeles, Calif., and Lee B. Benson, 5509 Matilija Ave., Van Nuys, Calif.

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3 Claims. (Cl. 4—172)

This invention relates in general to covers or enclosures for swimming pools and more particularly, to a swimming pool cover designed to exclude dirt and other foreign matter from the pool, to provide a means of safety against accidental falling of personnel into the pool and to provide an airtight enclosure for the pool.

Difficulties have existed in the past with the use of conventional pool covering apparatus which stem largely from the fact that the cover when extended over the pool is not in positive engagement with the edge marginal regions thereof so as to prevent dirt and other foreign matter from passing into the pool. Gusts of wind have a tendency to lift the edge marginal regions of the cover to provide a gap through which dirt and foreign matter may pass. Furthermore, many conventional swimming pool covers are extremely cumbersome to install and remove as well as being limited to specific applications. For sample, most conventional covers provide a certain degree of safety in regard to the accidental falling of personnel into the pool however, these same covers are not suitable for maintaining the pool clean and free from foreign matter. Still other conventional pool covers may be automatically disposed over the pool; however, the pool may not be used when the cover is so disposed. Furthermore, conventional pool covers do not provide for the maintenance of heat so that the water temperature of the pool may be controlled.

Therefore, it is a primary object of the present invention to provide a novel swimming pool cover assembly which, by reason of its novel structure, its relative lightness of weight, and the efficient and relatively simple means provided for holding it in operative position on the pool, and also by reason of its relative inexpensiveness, will be more practical than the swimming pool covers of the prior art.

Another object of the present invention is to provide a novel pool cover which may be readily attached to and removed from the swimming pool under controlled power.

Still another object of the present invention is to provide an improved means for holding a flexible pool covering sheet in place about its edge marginal regions on the pool coping to provide an airtight enclosure and whereby said sheet may be rolled up from one end of the pool.

Still another object of the present invention is to provide and improved swimming pool cover assembly including a blower means for supplying air between the surface of the water and the underside of the cover so that the cover will billow in dome-like configuration for easy removal of debris and other foreign matter which may rest on the cover as well as to provide an airtight enclosure under which personnel can swim.

A further object of the present invention is to provide a novel inflatable swimming pool cover which may be supported by the surface of pool water or which may be selectively inflated to provide an airtight enclosure.

Still a further object of the present invention is to provide is swimming pool cover which is transparent and flexible as well as strong enough to support substantial weight as that of a child or even an adult.

Other features and advantages of the present invention will appear from the following description when taken in connection with the accompanying drawings in which like

numbers of reference denote corresponding parts, in which:

FIGURE 1 is a perspective view of a swimming pool showing the cover apparatus of the present invention partially disposed in covering relation thereto;

FIGURE 2 is a top view of the cover gathering and feed mechanism, means for powering same and blower means incorporated in the apparatus of FIGURE 1;

FIGURE 3 is a side elevational view of the powering means shown in FIGURE 2 taken in the direction of arrows 3—3 of FIGURE 2;

FIGURE 4 is a side elevational view of the blower means of FIGURE 2 taken in the direction of arrows 4—4;

FIGURE 5 is an enlarged perspective view of the cable training means employed in gathering and feed mechanism is FIGURE 2;

FIGURE 6 is a sectional view of a portion of the cable training means taken in the direction of arrows 6—6 of FIGURE 5;

FIGURE 7 is an enlarged sectional view of a portion of the cover apparatus of FIGURE 1 taken in the direction of arrows 7—7;

FIGURE 8 is an enlarged perspective view of an end pulley arrangement employed in the cable training means; and

FIGURE 9 is an enlarged view of the cover seal located at the opposite end of the pool from its storage position when the pool is entirely covered.

The swimming pool shown in FIGURE 1 is typical of rectangular pools that are provided with cement or similar frame or curb **10** extending laterally from the edge marginal regions **11** of the pool. Pool water **12** is contained within the confines of the pool walls. Pool shown in FIGURE 1 is without and overflow gutter which may be part of the pool since the present invention is adaptable to pools with or without such gutters. Also, the shape of the pool is not material to the invention and same may be oval or irregularly shaped instead of rectangular.

The pool cover according to the present invention comprises, generally, a cover sheet **13** large enough to span the area of the pool cover, edge holding and training means **14** applied along two parallel sides of the pool for holding the sheet in pool-covering position, means **15** along the third side joining the extendable end of the sheet cover for holding the sheet in the pool covering position, and reeling means **16** secured to the fourth side of the cover sheet for holding the sheet in a pool covering position and constituting means on which said sheet is adapted to be rolled up.

The sheet **13** is preferably water impervious and is preferably made of transparent plastic materials of which the vinyls are examples. The transparent material presents a pleasing appearance to pool when the cover sheet is advanced from its storage position to cover the pool as color of the water and any reflections are visible. However, in the interest of improved strength and high resistance to tearing, the sheet is of a thickness suitable for supporting the weight of several adults.

The cover sheet, in the present invention, is generally rectangular and has its longitudinally parallel sides affixed to a cabling system having a traveling cable **17** which is guided and contained within a training means such as a channel **20** provided in flush relationship with the edge marginal regions of the pool coping. The cabling system is arranged so that when the cable is actuated, the pool cover will be drawn outwardly from its storage reel or when actuated in a reverse direction will cause the storage of the cover on the storage reel. As shown more clearly in FIGURE 8, the cable system includes an end pulley **21**

at the extreme end of the channel over which the cabling is trained and its direction of travel reversed.

Also attached to the cabling by a bracket means **22** as shown in FIGURE 7, there is provided a supporting beam **23** carried on a movable carriage **24** provided on opposite ends of the beam. Each carriage is provided with a pair of wheels **26** which roll on the surface of the edge marginal regions of the pool on the outside of the channels. As shown in FIGURE 7, one end of the covering is wrapped about the beam and joined by a bond at point **27.** The extreme end flap **25** of the sheet is permitted to extend into the pool water for airtight purposes and is held in this position by its own weight or a plurality of weights, such as weight **30** in FIGURE 1 which may be used. When the pool is entirely covered, flap **25** may be placed over the pool edge marginal region so as to form an airtight seal as shown in FIGURE 9.

Each carriage carrying the supporting beam is secured to fixture **22** by a flexible chain means **31** so that binding between the two carriages as the beam and cover is rolled outwardly from its storage reel will not have a tendency to occur. Furthermore, bracket **22** is provided with a brush **32** which engages the bottom of the channel so that any dirt, debris or foreign matter which may inadvertently pass into the channel will be collected at either end of the cable system and thereby easily removed. FIGURE 7 also shows the attachment of the edge of the sheet to the cable and the passage of the sheet upward in a vertical direction out of the channel into covering position with the pool.

FIGURE 6 shows the sheet covered cable portion of the cabling system as well as the uncovered portion **29.** Both portions travel in opposing directions within the channel.

One end of the pool is provided with a storage box or container **35** which houses a motor **36** for driving the cable system, a cable takeup and storage reel **37**, a cover sheet takeup reel **38** and a blower assembly **40.** These components are shown in FIGURES 2–4 wherein the motor **36** drives the cable takeup reel **37** via a pulley and belt arrangement **41** and a gear reduction mechanism **42** so that the load is carried by the cabling system and not by the cover during reel up or reel out of the cover. Motor **36** through a pulley and belt arrangement **43** and a gear reduction means **44** drives the cover takeup reel **38** so that the cover is wrapped evenly for storage. It is particularly to be understood that there is no load placed on the cover during takeup or reel out and that the power driving of the takeup reel **38** is for purposes of powering the sheet covered cable and for properly wrapping the cover about the reel. A plastic seal **39** is employed for airtight operation.

A feature resides in the fact that the motor is pivotally mounted on a support **45** as shown in FIGURE 3 and that the motor is manually actuated to one side or the other of its pivot point by means of a handle **46.** When the handle is actuated to the left side of the pivot, the belt and pulley arrangement **43** between the motor and reel **38** is engaged so that the reel will rotate to draw the cover from the pool and about the reel for storage. However, when the handle **46** is positioned to the right hand side of the motor pivot support, belt arrangement **41** is tightened so that the reel **37** is actuated to draw the cabling about its storage reel **37** for drawing the cover outwardly. Handle **46** may be remotely operated by the inclusion of suitable actuators.

The cabling system includes a plurality of directing pulleys which maintain the cabling system in tension as well as directing the cable to desired locations. A pair of idler pulleys **49** are not secured to any structure and are employed for compensating purposes between the cabling associated with one side of the pool cover and cabling associated with its other side.

FIGURES 2 and 4 show more clearly a blower system whereby ambient air is drawn into the housing **35** and forced beneath the cover into the pool area above the water surface for inflating the flexible pool cover. In this fashion, the cover can be caused to billow upwardly to provide a dome-like configuration which carries any debris, dirt or other foreign matter which may have collected on top of the cover. In this position, the top of the cover may be hosed to wash off any such dirt or debris in a convenient fashion. Furthermore, a feature resides in the fact that water temperature can be controlled by placing an air barrier between the cover and the surface of the water. This has the important effect of reducing operating costs in heating the pool water and maintaining a desired temperature. FIGURE 7 shows the cover sheet in a billowed fashion in broken lines. The air provided by the blower is maintained between the surface of the water and the underside cover sheet by the extended flap **25** which is passed around the supporting beam. However, when not inflated, the cover rests on and is supported on the water surface as shown in solid lines.

FIGURES 5 and 6 show a guiding means for positioning the cover sheet as the cable is actuated so that the cover may be stored on its supporting takeup reel. Such a guiding means includes a guidepost **50** having a contoured head **51** engaging with the inside surface of the pool cover. The means also includes a notched element **52** having a transverse horizontal slot **53** through which sheet covered cable portion passes. The cooperating effect of the head **51** and slot **53** of element **52** is to cause the sheet to travel in a horizontal direction as opposed to a vertical direction. The sheet is shown in a projecting and vertical direction as it passes in the channel. The sheet covered cable portion after repositioning passes a guide roller **54** to its respective storage reel. The uncovered cable portion is directed about a pulley **54*a*** from its reel **37.**

The means for starting and stopping motor **36** includes a switch mechanism **47** which projects into contact with a flange plate **48.** The flange plate includes a notch in the center thereof in direct alignment with the neutral or central pivot point of the bracket support **45.** When the motor is pivoted to the left hand side, or the right hand side of the pivot point, the projection **47** will be pushed inwardly to make contact with an electrical circuit for motor actuation. However, when the motor is in its central or neutral position, the projection **47** will be biased outward into the notch of the flange plate **48** opening the electrical circuit causing the motor to be inoperative.

Therefore, it is seen from the above description that the present invention includes a pool cover which may be selectively disposed in partial or in full covering relationship respective to the pool water **12.** The pool cover is disposed over the pool by manually actuating lever **46** to the right hand side of the motor pivot support so that the motor will become operative and through the pulley and belt arrangement **41** so that the cabling system will be actuated via drum **37** to pull the cover from its takeup reel **38.** As the drum **37** rotates, the cabling system will cause the carriages **24** supporting the beam **23** to move outwardly from housing **35.** When the cover **13** has been either fully or partially disposed over the pool, blower **40** may be actuated to draw ambient air through an aperture in the housing into the area beneath the pool cover so that the cover will inflate and billow. In this condition, the pool may be used by a swimmer to permit swimming beneath the covered portion of the pool. In this fashion, the cover serves as an enclosure by which the water temperature may be maintained relatively constant since the air retained beneath the cover will serve as an insulating barrier.

To remove the cover **13** from the pool and place it in its storage position, handle **46** is moved to the right hand side of the motor support pivot point which causes the motor to actuate and causes the takeup reel **38** for the

cover to pull the supporting beam **23** and its movable carriages **24** back into storage position adjacent the housing **35**.

A feature of the present invention resides in the composition of the vinyl plastic or the like which passes long wave radiations, such as infrared, but is opaque to the shorter wave radiations such as ultraviolet. Thus, this feature has the effect of permitting the pool water to receive heat from the sun so that the temperature of the water may be readily maintained when the pool cover sheet is disposed over the pool area, while tending to resist the reception by the pool water of those elements of sunlight which cause chemical reaction and deterioration so that prolonged life is obtained for the chemicals normally used for hygienic and clean condition of the pool water.

Having described only typical forms of the invention we do not wish to be limited to the specific details herein set forth, but wish to reserve to ourselves any variations or modifications that may appear to those skilled in the art and fall within the scope of the following claims.

We claim:

1. In combination with a swimming pool, a cover sheet of substantially impervious flexible material disposed at and along one end of said pool for extension and retraction with respect to said pool, said cover sheet having slack across its width sufficient to permit it to float on the surface of the water in the pool, said cover sheet having longitudinal edges; vertical slideways along the longitudinal cover sheet edges; means for extending and retracting said cover sheet including a cover reel, a pair of cables secured to said cover sheet, means for operating said cables, guide means for said cover edges adjacent said cover reel for moving said edges from a substantially horizontal position on said cover reel to a substantially vertical position in said vertical slideways, and cable guide means on the opposite side of said pool from said reel about which said cables pass to reverse direction of travel of said cables so that upon actuation of said extending and retracting means said cables are payed on and off said cover reel.

2. In combination with a swimming pool as in claim **1**, and having a blower system for maintaining said cover sheet inflated, said blower system including means positioned in close proximity to said cover reel for directing air from said blower beneath said cover sheet for maintaining said sheet billowed above the water surface.

3. In combination with a swimming pool:

a cover sheet of flexible material disposed at and along one end of said pool for extension and retraction with respect to said pool, said cover sheet having slack across its width sufficient to permit it to float on substantially the entire surface of the water in the pool, said cover sheet having its longitudinal edges thickened as slides;

slideway strips secured along longitudinal margins of the pool and having re-entrant vertical slideway channels which slidably receive said thickened edges of the cover sheet and anchor them laterally of the pool;

means for extending and retracting said cover sheet including a cover reel;

guide means for said cover sheet edges adjacent said cover reel for moving said edges from a substantially horizontal position on said cover reel to a substantially vertical position in said vertical slideways;

and a relatively rigid strip secured to and along the forward margin of said cover sheet as the leading edge thereof.

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LAVERNE D. GEIGER, *Primary Examiner.*

FRANK E. BAILEY, FRANK H. BRONAUGH, *Examiners.*

H. KLINKSIEK, H. GROSS, *Assistant Examiners.*