The present invention relates to a sliding panel assembly intended primarily as a top for radio-phonograph cabinets but usable otherwise and elsewhere.

A primary object of the present invention is the provision of a supporting frame structure and adjacent panels, such as top panels, which are substantially coplanar so as to abut in a first or closed position and at least one of which is movable from the first position to a second or open position to the side or below the second panel, whereby the panels constitute a flush top surface in the closed position of the assembly. The track structure is constructed and arranged to provide access to an instrument compartment in its open position.

A further object of the present invention is the provision of a new and improved assembly of the character set forth above including flexible tracks for receiving and holding the edges of the movable panel in its first position and guiding the panel in its movement between its closed and open positions.

Another object of the present invention is to provide a new and improved sliding panel assembly in which the movable panel is slidably mounted upon a flexible track structure and is biased to its closed flush position by spring means acting upon the track structure.

Another object of the present invention is the provision of the assembly as set forth above in which the movable panel is slidably supported in opposed tracks and the tracks are movable in a first pair of slots in the frame structure and a second and inclined pair of slots is provided to guide the second or other panel for reception of the panel in its retracted position and in which, furthermore, the tracks and slots in the frame structure are constructed and arranged to minimize warping of the movable panel in both its closed and open positions, thus making it possible to use relatively thin panels in the cabinet.

Another object of the present invention is the provision of a sliding panel assembly with related structure including a movable cabinet portion enabling the sliding panel to be inserted into the assembly as well as removed therefrom after assembly, should occasion arise for repair or the like.

In brief, the sliding panel assembly of the invention includes a frame structure adapted to constitute the top of a cabinet. Supported on the frame structure are a pair of panels, at least one of which is movable, and which are arranged to be substantially coplanar with each other and with the top of the frame structure and arranged to abut in the closed position of the panels. One of the panels is movable from its first and closed position to a second and retracted open position. The movable panel is slidably mounted in the second pair of grooves of the frame structure. The frame structure includes a pair of slightly inclined grooves under the fixed panel and a pair of tracks for receiving the edges of the movable panel in its retracted position, thereby to prevent warpage of the panel in its latter position. The track structure includes also a second pair of grooves for receiving the edges of the panel during its movement between open and closed positions.

The edges of the panel are mounted in opposed flexible tracks mounted in the second pair of grooves and the latter are of transverse widths sufficient to permit movement of the panel and tracks so as to enable the panel readily to be moved into the inclined slot under the fixed panel without any undue binding of the movable panel during its movement and without the necessity in having close dimensioning tolerances in the slot or groove structures. The flexible tracks engaging the edges of the panel are biased upwardly into closed position of the panel by spring means engaging the tracks whereby frictional forces on the panel and wear of the panel are eliminated. Further to prevent warpage, an end of the panel is also received in a groove in the frame structure in the closed position of the panel. The tracks are made of suitable plastic material such as expanded polyethylene and they are generally U-shaped in section so as to embrace the edge portions of the panel. Cellulose acetate butyrate or nylon may be used. The tracks are sufficiently flexible to permit some transverse movement of the sliding panel so that it can readily enter the grooves under the fixed panel. They are, however, also relatively stiff so as to hold the edges of the panel against substantial warpage. Also, the cabinet is provided with a removable strip or crosspiece at one end to permit insertion as well as removal of the sliding panel with respect to the assembly. Other objects and advantages of the present invention will become apparent from the ensuing description of an illustrative embodiment thereof in the course of which reference is had to the accompanying drawings, in which:

FIG. 1 is a fragmentary perspective view of a radio-phonograph cabinet embodying the present invention and in which the movable panel is shown substantially in its fully open position in which it is retracted underneath a second or relatively stationary panel.

FIG. 2 is a perspective view illustrating the movable panel in its closed position and coplanar with its associated second and stationary panel, whereby to provide a flush cabinet top construction.

FIGS. 3 and 4 are enlarged fragmentary transverse views taken along the lines 5–3 of FIG. 7 and 4–4 of FIG. 8.

FIG. 5 is a fragmentary vertical longitudinal cross sectional view of the right end of the assembly with the movable panel generally in the position illustrated in FIG. 8;

FIG. 6 is a vertical longitudinal cross sectional view taken along the line 6–6 of FIG. 3 and illustrating details of one of the two springs utilized to bias the movable panel to its closed flush position.

FIGS. 7, 8 and 9 are longitudinal cross sectional views taken along the line 7–7 of FIG. 11 and illustrating the movable panel in three positions: the first of which is its closed and flush position; the second an intermediate position; and the third the fully open position.

FIG. 10 is a fragmentary end elevation view along the line 10–10 of FIG. 7 illustrating details of a removable cabinet part through which the sliding panel may be inserted in and removed from the frame assembly; and

FIG. 11 is a view of the underside of the assembly with the movable panel in closed position and taken along the line 11–11 of FIG. 7.

Referring now to the drawings, the sliding panel assembly of the present invention is indicated as forming the top of a phonograph cabinet, indicated as a whole by reference character 10. The cabinet 10 includes a lower compartment defining structure 12 and the sliding panel assembly is indicated as a whole by reference character 14.

The panel assembly includes a generally rectangular
3 frame structure 16 and a pair of panels 20 and 22, of which at least one, such as the panel 22, is movable relative to the other between closed and open positions. The frame 16 includes front and rear longitudinal frame elements 16A and 16B and left and right side frame elements 16C and 16D. The four frame elements are secured together in suitable fashion to form with the panels a flush top surface when the panel 22 is in its closed position.

In the closed position of panel 22, the two panels are flush with each other and the frame 16, as indicated best in FIGS. 2 and 7. In its open or retracted position, the panel 22 is disposed beneath the fixed panel 20, as best illustrated in FIGS. 1 and 9, so as to provide access to a compartment 24 at the upper side of the cabinet 26 to make accessible a record player 26, illustrated only in FIG. 1.

Movement of the sliding panel between its closed and open positions, as well as rotation of the movable panel in a manner to minimize warping thereof in the closed position, is facilitated by mounting the front and rear edges of the panel in opposed substantially U-shaped flexible plastic front and rear tracks 30A and 30B extending from the right end of the frame to adjacent the fixed panel 20. These tracks are generally U-shaped in section so that the top and bottom sides closely embrace the front and rear narrowed edges 22A and 22B of the movable panel 22.

In order to provide for desired movement of the panel 22 so that it may more readily be moved underneath the fixed panel, the tracks 30 are not only flexible transversely but they are mounted in fairly wide grooves 32A and 32B formed in the insides of the right ends of the longitudinal frame elements 16A and 16B. The grooves 32A and 32B are milled at the insides of the front and rear frame elements 16A and 16B. The grooves include top surfaces 32C and bottom surfaces 32D (see especially FIG. 7) of which the latter is about one half the length of the former to enable the movable panel to be moved downwardly for ready entry into slots under the fixed panel. The ends of the tracks remote from the junction of the panels are pivotally secured to the frame elements 16A and 16B by means of the hinges 33 driven through the bights of the tracks (see FIG. 5). Warpage of the movable panel 22 is prevented also by having a narrowed end 22C of the panel enter a groove 16E (see FIG. 5) in the end frame element 16D in the closed position of the panel.

In accordance with a further feature of the invention, the sliding panel 22 is maintained in its flush closed position by a pair of spring means 34 engaging the undersides of the tracks 30 near the ends of the latter adjacent the fixed panel, as best illustrated in FIGS. 3, 4 and 6. The springs have one end 43A bearing against the underside of an associated track and a fixed end 34D entering into a hole in the associated longitudinal frame element (see FIG. 6) and an intermediate coiled portion 34C around a screw 34D. As a result of having the springs bear against the track, friction upon and possible wear of the underside of the panel is minimized. Also, more uniform movement of the movable panel is made possible.

In its retracted open position, the sliding panel is received in opposed slightly inclined grooves 40 under the stationary panel 20. The grooves 40 are milled partly into the frame elements 16A and 16B and into supports 41 secured underneath the frame members 16A and 16B, as particularly illustrated in Figs. 3, 4 and 7. The grooves are dimensioned relatively closely to receive the narrow edges 22A and 22B of the sliding panel. Each of the grooves 40 is provided with a bottom surface 40A that extends to a point below the tracks and inner edges of the sliding panel in its closed position (see FIGS. 6 and 7), whereby the movable panel rests on the bottoms of the grooves when it is depressed for movement to its retracted position, whereby it is readily enter the slot. The engagement of the edges of the movable panel with the slot structure prevents warpage of the panel in its retracted position. Also, the inner end of the panel is provided with a transversely supporting strip 42 which serves at all times to prevent warpage of the inner end. The strip also engages the underside of the fixed panel in the closed position of the movable panel, as illustrated in FIG. 7, thereby determining the flush position of the movable panel.

The extreme retracted position of the movable panel 22 is determined by a felt or other resilient stop 44, which may be secured to the inside of the cabinet 46, as shown in FIGS. 7 through 11.

The movable panel is adapted to be inserted into the top assembly as well as to be removed from the assembly subsequent to manufacture upon removal of the cabinet part 46. The part 46, referring to FIGS. 7 to 11, is a transverse crosspiece extending between end posts 50A and 50B and secured to the top of an end panel 52 and which may be notched as illustrated at 50C to receive the panel 22, if such be required by the width of the panel. The crosspiece is secured to the underside of frame piece 16C by the screws 54. Once the panel has been inserted into place the crosspiece 46 can be placed and secured in position. To remove it at some later time to permit removal of the panel, all that is necessary is that the screws 54 be loosened so that the crosspiece can be removed. If desired, a crosspiece similar to 46 may be used at the right end of the cabinet for purposes of symmetry.

To facilitate movement of panel 22, it is provided with a finger cup 60 near its right end.

It is believed that the construction and operation of the present invention will be apparent from the above detailed description. However, in brief, the frame assembly is adapted to be constructed as described and then assembled on and attached to the top of the cabinet. Generally, the assembly is secured prior to placement of the panel 22 in place so that the latter can be finished separately from the remainder of the cabinet. To place the sliding panel 22 in position it is inserted on to the grooves 40 through the space provided by the crosspiece 46. Once the panel is placed in position, the crosspiece 46 is assembled in place, thereby to close the cabinet structure.

Assuming that the movable panel 22 is in its indicated position flush with the fixed panel, all that is required to open the cabinet is to depress the end of panel 22 adjacent panel 20 and then move the panel 22 as by moving it to the left through a finger cup 60. It will be noted that the depression of the movable panel 22 is against the force of springs 34, which maintain the panel in its flush position. The panel 22 slides in the tracks 30, which are flexible and pivot slightly so that the movable panel can more readily orient itself to move into alignment with and readily enter into the grooves 40 underneath the stationary panel 20.

The movable panel is protected from warping by its front and rear edges being received in the track 30 and its end edge 22C being received in groove 16E in frame members 16D. The end adjacent the fixed panel is prevented from warping by the strip 42, which also determines the flush position of the movable panel, which it does upon engagement of the underside of the fixed panel.

Should it become necessary to remove panel 22, the crosspiece 46 can be removed and then panel 22 can be slid out of the cabinet.

While the present invention has been described in conjunction with the details of an illustrative embodiment, it should be understood that these details are not intended to be limiting of the invention except as shown in the accompanying claims.
What is claimed as new and desired to be secured by Letters Patent of the United States is:

1. A sliding panel assembly including a frame structure and a pair of panels that are substantially coplanar so as to be movable from its first coplanar position to a second position generally to one side of the second panel, said structure including opposed grooves for receiving opposed edges of said one panel in said second position, and means slidably mounting said one panel for movement between its two positions including opposed flexible tracks receiving the said edges of said one panel in its first position and during movement between its two positions.

2. A sliding panel assembly including a frame structure and a pair of panels that are coplanar in a first position and at least one of which is movable from its first coplanar position to a second position generally to one side of the second panel, said structure including opposed grooves for receiving opposed edges of said one panel in said second position, and means slidably mounting said one panel for movement between its two positions including opposed tracks closely engaging the said edges of said one panel in its first position and during movement between its two positions, said tracks being somewhat flexible transversely and the portions thereof embracing the edges of the panel being sufficiently rigid to prevent any substantial warping of the edges.

3. A sliding panel assembly including a frame structure and a pair of panels that are coplanar in a first position and at least one of which is movable from its first coplanar position to a second position generally to one side of the second panel, said structure including opposed grooves for receiving opposed edges of said one panel in said second position, means slidably mounting said one panel for movement between its two positions including opposed flexible tracks receiving the said edges of said one panel in its first position and during movement between its two positions, and spring means biasing the said panel toward its first position.

4. A sliding panel assembly including a frame structure and a pair of panels that are coplanar in a first position and at least one of which is movable from its first coplanar position to a second position generally to one side of the second panel, said structure including opposed grooves for receiving opposed edges of said one panel in said second position, means slidably mounting said one panel for movement between its two positions including opposed flexible tracks receiving the said edges of said one panel in its first position and during movement between its two positions, said frame being spring means disposed in proximity to the junction of the panels in the first position for biasing the tracks and the panel supported thereby toward its first position.

5. A sliding panel assembly including a frame structure and a pair of panels that are coplanar in a first position and at least one of which is movable from its first coplanar position to a second position generally to one side of the second panel, said structure including opposed grooves for receiving opposed edges of said one panel in said second position, and means slidably mounting said one panel for movement between its two positions including opposed flexible tracks receiving the said edges of said one panel in its first position and during movement between its two positions, said frame structure including first opposed grooves at said one side of the second panel closely receiving the edges of the movable panel in its second position and relatively wider and second opposed grooves for receiving the tracks and permitting transverse movement of the tracks and movable panel so that the movable panel can be aligned with the first grooves for longitudinal movement therein.

6. A sliding panel assembly including a frame structure and a pair of panels that are coplanar in a first position and at least one of which is longitudinally movable from its first coplanar position to a second position generally to one side of the second panel, said structure including opposed grooves for receiving opposed edges of said one panel in said second position, and means slidably mounting said one panel for movement between its two positions including opposed flexible tracks receiving the said edges of said one panel in its first position and during movement between its two positions, said frame structure including first opposed grooves at said one side of the second panel closely receiving the edges of the movable panel in its second position and relatively wider and second opposed grooves for receiving the tracks and permitting transverse movement of the tracks and movable panel so that the movable panel can be aligned with the first grooves for longitudinal movement therein.

7. A sliding panel assembly including a frame structure and a pair of panels that are coplanar in a first position and at least one of which is longitudinally movable from its first coplanar position to a second position generally to one side of the second panel, said structure including opposed grooves for receiving opposed edges of said one panel in said second position, and means slidably mounting said one panel for movement between its two positions including opposed flexible tracks receiving the said edges of said one panel in its first position and during movement between its two positions, said frame structure including first opposed grooves at said one side of the second panel closely receiving the edges of the movable panel in its second position and relatively wider and second opposed grooves for receiving the tracks and permitting transverse movement of the tracks and movable panel so that the movable panel can be aligned with the first grooves for longitudinal movement therein.

8. A sliding panel assembly including a frame structure and a pair of panels that are coplanar in a first position and at least one of which is longitudinally movable from its first coplanar position to a second position generally to one side of the second panel, said structure including opposed grooves for receiving opposed edges of said one panel in said second position, means slidably mounting said one panel for movement between its two positions including opposed flexible tracks receiving the said edges of said one panel in its first position and during movement between its two positions, said frame being spring means disposed in proximity to the junction of the panels in the first position for biasing the tracks and the panel supported thereby toward its first position.

9. A sliding panel assembly including a frame structure and a pair of panels that are coplanar in a first position and at least one of which is longitudinally movable from its first coplanar position to a second position generally to one side of the second panel, said structure including opposed grooves for receiving opposed edges of said one panel in said second position, means slidably mounting said one panel for movement between its two positions including opposed flexible tracks receiving the said edges of said one panel in its first position and during movement between its two positions, said frame structure including first opposed grooves at said one side of the second panel closely receiving the edges of the movable panel in its second position and relatively wider and second opposed grooves for receiving the tracks and permitting transverse movement of the tracks and movable panel so that the movable panel can be aligned with the first grooves for longitudinal movement therein.

10. A sliding panel assembly including a frame structure and a pair of panels that are coplanar in a first position and at least one of which is longitudinally movable from its first coplanar position to a second position gen-
7 generally to one side of the second panel, said structure including opposed grooves for receiving opposed edges of said one panel in said second position, and means slidably mounting said one panel for movement between its two positions including opposed flexible tracks receiving the said edges of said one panel in its first position and during movement between its two positions, said frame structure including first opposed grooves at said one side of the second panel closely receiving the edges of the movable panel in its second position and relatively wider and second opposed grooves for receiving the tracks and permitting transverse movement of the tracks and movable panel so that the movable panel can be aligned with the first grooves for longitudinal movement therein, spring means for biasing the movable panel toward its coplanar position, and the one panel having a transverse strip at its underside engageable with the underside of the fixed panel for determining the first position of the movable panel.

8 A cabinet construction including an end wall and a sliding panel assembly adapted to be seated on the top of the cabinet, said sliding panel assembly including a pair of panels, at least one of which is movable relative to the second, said one panel being movable to a retracted position underneath the second panel, and said cabinet including a removable crosspiece at one end which, when removed, provides a space through which said movable panel can be removed from the assembly.

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