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3,606,449

TRAY HOLDER FOR SEATS

Filed Jan. 8, 1969

3 Sheets-Sheet 1

FIG. 1

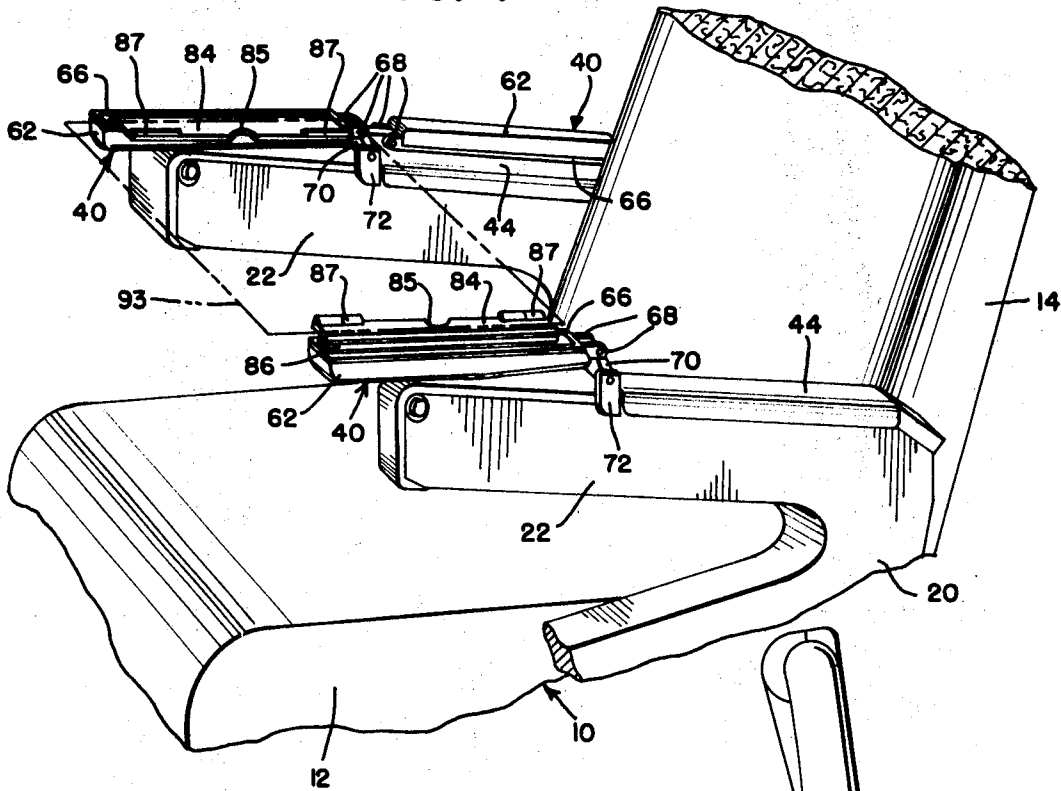
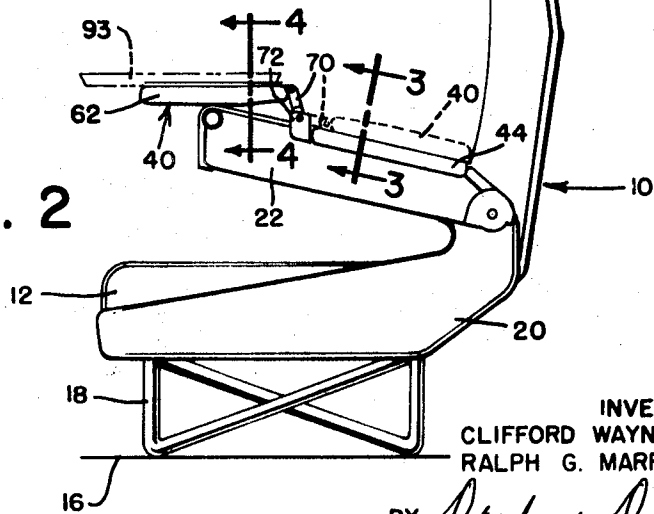


FIG. 2



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FIG. 3

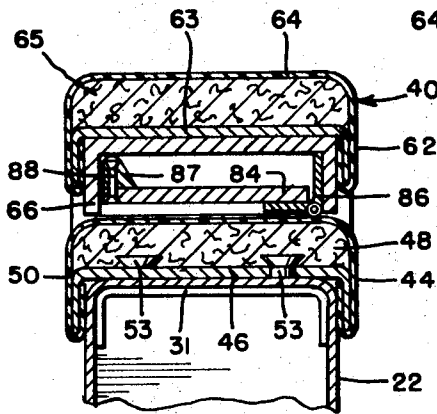


FIG. 4

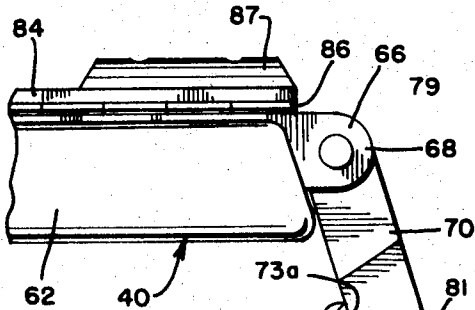
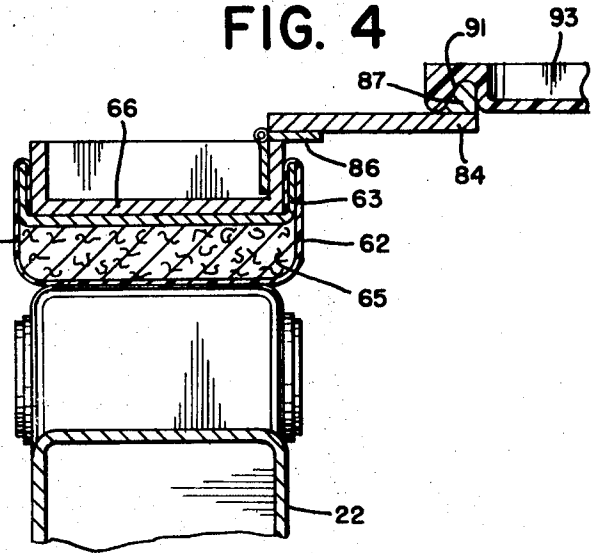


FIG. 5

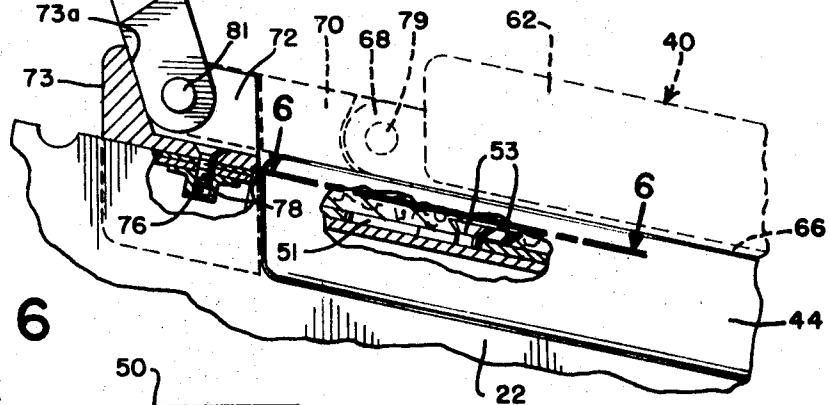
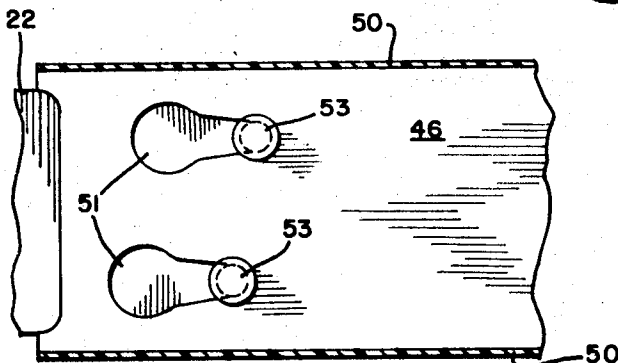


FIG. 6



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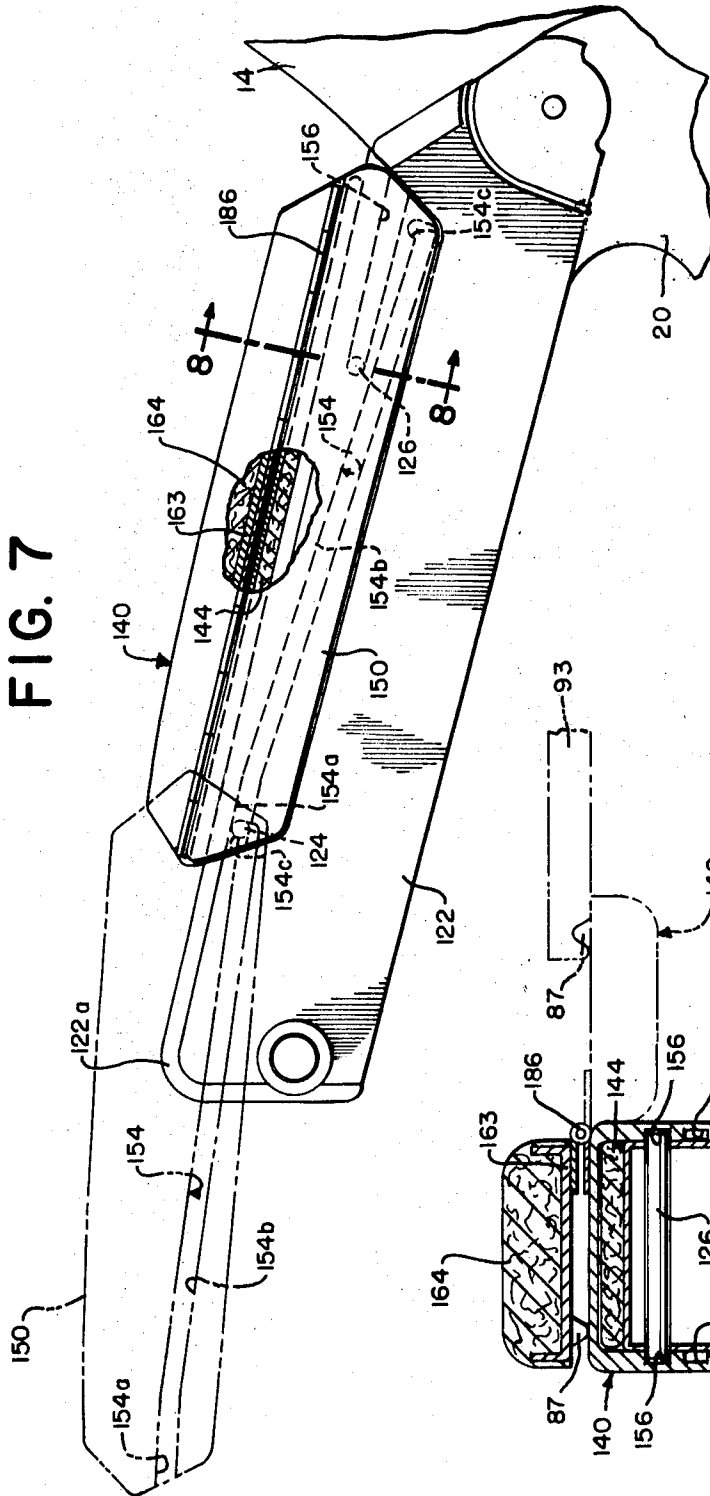


FIG. 7

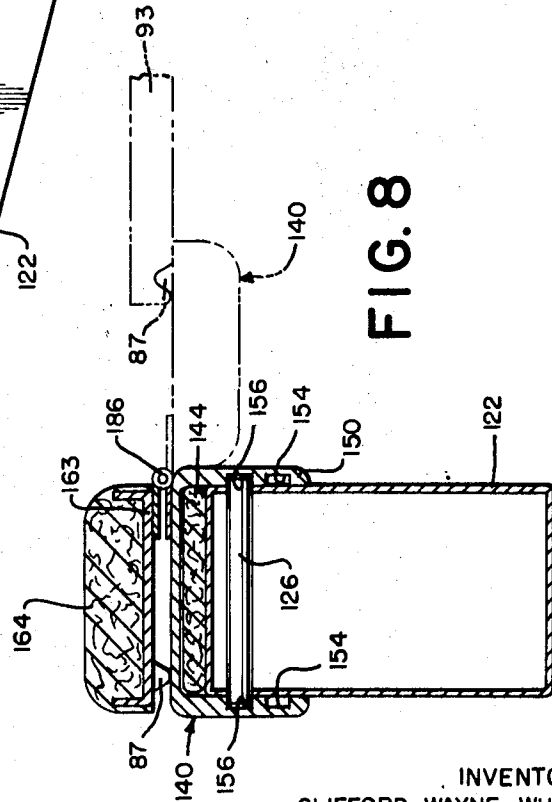


FIG. 8

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TRAY HOLDER FOR SEATS

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4 Claims

ABSTRACT OF THE DISCLOSURE

A tray-holding arrangement for use in conjunction with vehicle seats in which each of the arms of a seat is provided with a dual, or paired, armrest arrangement. The upper armrest of each pair is movable away from lower, stationary armrest and includes a storable shelf which can be folded outwardly for supporting and holding a tray.

In vehicles, such as aircraft, buses or trains, used for transporting numbers of passengers, it is often necessary or desirable to feed the passengers one or more times during a given trip. In a typical vehicle configuration where passengers are to be fed, each passenger sits in his individual seat and a tray-holding device is used. This device, in an aircraft, is usually in the form of a small table which is folded down from the rear of the seat directly in front of the passenger. In some instances, where there is no seat immediately in front, an arrangement is provided wherein the tray is mounted directly on the arms of the passenger's seat by a socket and post arrangement.

While the foregoing tray-holding arrangements operate satisfactorily, they have several disadvantages. First of all, the mechanism for folding down from the seat in front a table on which the tray is placed, in spite of its apparent simplicity, is a relatively complex one which is fairly costly to produce. These folding table mechanisms typically require a hinge for the table, a number of extending arms for holding the table substantially horizontal, and a rather complex set of pivots for stowing the entire arrangement flat against the forward seat. The socket and post arrangement, while relatively simple in construction, has disadvantages in that it is sometimes difficult to properly place the tray-holder into the socket and further, the holder must be stored remote from the seat.

The present invention relates to an improved arrangement for holding trays at a seat which eliminates many of the aforesaid disadvantages. In accordance with the invention, a tray-holding member is provided on each arm of a seat in the form of a dual armrest arrangement. The tray holder is located in upper armrest of a pair of arm rests provided for each arm of the seat. When not in use, the armrest containing tray-holding member is stowed in a fixed position on the seat arm and its top side normally serves as an armrest for the passenger. When being used, the upper armrest on each seat arm containing the tray holding member is moved outwardly, away from the seat, exposing a fixed lower armrest for use by the passenger. The underside of the upper armrest with the tray-holding member houses a hinged shelf which is folded outwardly to provide a support for a tray between the two seat armrests.

It is therefore an object of the present invention to provide a novel tray-holding arrangement which is located in the arms of a seat.

Another object is to provide a tray-holding arrangement in which the arms of a seat are formed with a pair of armrests, the lower one of the armrests being stationary and the upper one being movable away from the seat arm and having a tray-holding shelf therein.

An additional object is to provide a tray-holding arrangement in which an armrest which is movable outwardly from the seat contains therein a hinged shelf for holding a tray.

5 Other objects and advantages of the present invention will become more apparent upon reference to the following specification and annexed drawings in which:

10 FIG. 1 is a perspective view of the tray-holding mechanism of the present invention shown mounted on a seat, only a portion of which is shown;

FIG. 2 is a side elevational view of a complete seat showing a tray-holding member in its extended position and also showing, in dotted lines, the member when it is stored;

15 FIG. 3 is a cross-sectional view of a seat arm taken along line 3—3 of FIG. 2;

FIG. 4 is a cross-sectional view taken along lines 4—4 of FIG. 2 showing a tray-holding member with the shelf extended for holding a tray;

20 FIG. 5 is a plan view taken partially in section and being partially broken away of the hinge portion of one of the tray-holding members and a portion of the lower stationary armrest;

FIG. 6 is a sectional view of a portion of the stationary armrest taken along line 6—6 of FIG. 5;

25 FIG. 7 is a perspective view partly broken away of another embodiment of the invention; and

FIG. 8 is a cross-sectional view of the arm and tray holder taken through lines 8—8 of FIG. 7.

30 Referring to FIGS. 1 and 2, a vehicle seat 10 is shown with the usual bottom cushion member 12 and backrest 14. The cushion 12 is located within a shell or base 20, to which a mounting support 18 is connected. The seat base 20 is mounted to the floor 16 of a vehicle such as an aircraft, bus train by any suitable means, such as bolts (not shown). The backrest 14 of the seat may be adjustable with respect to the cushion 12 by any suitable lock arrangement. This is not shown since it forms no part of the present invention. For a multi-seat configuration, the cushion 12 could serve as a common bench type cushion and a number of separate, adjustable backs provided. Of course, these can be separate cushions 12 for each seat and the seats mounted side-by-side.

35 The seat 10 of FIGS. 1 and 2 has a pair of arms 22. In FIG. 1 the left arm is of single-width construction while the right arm is of double-width, it being considered, for example, that the seat 10 of FIGS. 1 and 2 is an aisle seat for the right-hand side of the vehicle and there would be another seat immediately adjacent to the right arm 22 for which the aisle seat 10 of FIG. 1 would carry the left armrest. Of course, single seats can be constructed, each having its own pair of arms. The arms 22 can also house any suitable or desired controls, such as a stewardess call button, fresh air controls, seat locks, etc.

40 Each arm of the seat has a stationary, lower armrest 44 mounted thereon. On a double-width arm of a seat there would be two such separate armrests or a single double-width stationary armrest. A hinged, tray-holding and upper armrest member 40 is mounted on each of the arms 22 of the seat, there being two such members 40 shown on the double-width, right-hand arm. One of these members is for the next adjacent seat (not shown).

45 As shown in FIGS. 1-3, the tray-holding member 40 is hinged and rests on top of the stationary armrest 44 when not in use. As seen in FIG. 3, each stationary armrest 44 includes a U-shaped channel frame 46 on which a padded material 48 is held by an outside cover 50 of a suitable decorative material. The stationary armrest 44 is mounted to the seat arm 22, as shown in FIGS. 5 and 6, by a plurality of T-shaped holes 51 in the channel frame 46 which fit over corresponding headed studs 53. These studs are mounted on the upper wall of the arm

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22 which is made, for example, of a suitable structural material such as steel. A reinforcing plate 31 is shown in FIG. 3 beneath the arm's upper wall. Additional screws, or other fasteners (not shown) can also be used to hold the stationary armrest 44 to the arm.

Each tray-holding member 40, as shown in FIGS. 3 and 4, has an armrest 62 formed by padded material 65 held on a U-shaped base plate 63 by a suitable decorative outer cover 64. The base plate 63 of the armrest assembly 62 is mounted on a rigid U-shaped channel frame member 66 which runs substantially the entire length of the tray-holding member 40 by any suitable mounting means such as screws (not shown). The side walls of the channel frame member 66 extend beyond the arm rest 62 (see FIG. 5) to form a bifurcated hinge 68. One end of hinge link 70 is pivotally connected to each hinge member 68 of the tray-holding member 40 by a hinge pin 79. The other end of each hinge link 70 is pivotally connected by a hinge pin 81 to a stationary hinge 72. The hinge 72 for each link 70 is mounted in a bracket 73 which is in turn mounted on the arm 22 forward of the stationary armrest 44 by a suitable fastening arrangement such as a screw 76 (FIG. 5) which is screwed into a nut 78 fastened to the underside of the arm's top wall.

A tray-holding shelf 84 is mounted within the channel 66 of each of the tray-holding members 40 by a hinge 86. One leaf of the hinge 86 is shown fastened to the inner wall of one of the legs of the channel while the other leaf is fastened to the underside of the shelf 84 (see FIG. 4). Hinge 86 can be a single continuous hinge or a number of hinges. In the former case a piano-type hinge can be used. As shown in FIG. 4, when the shelf 84 is extended the hinge leaf fastened to shelf 84 rests against the edge of one of the channel legs to provide stability for the shelf. The shelf 84 is preferably a continuous member that has mounted thereon by suitable fasteners such as the studs or rivets 88 a plurality of wedge-shaped posts 87 which engage and hold a tray.

The operation of the tray-holding arrangement of FIGS. 1-6 is relatively simple. When no food is being served and the tray-holding member is otherwise not in use, each member 40 associated with a seat is folded to the dotted line position shown in FIG. 2. The folded condition is also shown in FIG. 3. In this case, the shelf 84 is folded within the channel 66 of each upper armrest member 40 and the channel legs or the bottom of the hinge 86 rests on the top of the lower stationary armrest 44. The armrest 62 of each member 40 is therefore face up and available for use by the passenger.

When it is desired that a tray be held at the seat, each of the members 40 on the two arms of the seat is moved upwardly and outwardly, pivoted by the pairs of hinges 68 and 72 and the cooperating hinge links 70, to the fully extended position shown by the solid lines in FIGS. 1, 2, 4 and 5. The hinge links 70 pivot the tray-holding members 40 not only upwardly and outwardly but also slightly forward with respect to the arm. This gives each member 40 two degrees of freedom so that it can be located substantially horizontal.

As shown in FIG. 5, the hinge links 70 rest against the inclined front wall 73a of the base hinge bracket 72 which serves as a stop. When the tray-holding member 40 is extended outwardly to its use position, the padded armrest portion 62 rests on the front end of the arm 22 as shown in FIGS. 1, 2 and 4. While this support arrangement provides added stability, it is not absolutely necessary.

To provide additional stability for the tray, if desired, the hinge pin 81 for each of the hinge links 70 can be a single piece extending through the stationary hinge member 72. In this instance the stationary hinge member 72 is provided with an additional keyhole slot so that the single hinge pin can rest in the slot when the holding member 40 is extended. This prevents the mem-

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ber 40 from moving backward toward the seat at any given time. A similar arrangement can also be used for the hinge links 70, hinges 68 and the hinge pins 79.

When a tray-holding member 40 is in the extended position, a finger hole 85 (FIG. 1) of its shelf 84 is accessible to the passenger or stewardess. The shelf is folded outwardly by putting a finger through hole 85, grasping the underside of the shelf and lifting it. The shelf pivots outwardly on hinge 86 to the position shown in FIG. 4 where one of the leafs of hinge 86 rests against one of the channel legs 66. The wedge piece or pieces 87 which are normally located within the channel 66 when the shelf is in the stored position are now exposed on the upper face of the shelf. These wedge members, two of which are shown in FIG. 1 on each of the shelves 84, fit within a corresponding groove 91 in a tray 93 which is to be held between the two members 40 of a seat. This arrangement prevents the tray from sliding from side to side and also fore and aft if the grooves on the tray have the necessary stops. When the two tray-holding members 40 of a given seat are folded outwardly and the shelves fully exposed, the tray 93, shown in dotted lines in FIGS. 1 and 2, may be placed and firmly held therebetween.

It should be noted that most trays currently in use in aircraft are already provided with the grooves 91. Thus, the tray-holding mechanism of the present invention does not require a special tray, that is, one that is different from those already in use. It also should be understood that existing seats can be modified to use the subject invention by providing the stationary armrest 44 and the tray-holding member on each arm or just by adding the member 40 and its associated hinge base 73 to each arm. The exact modification required would depend upon the existing seat configuration.

FIGS. 7 and 8 show another embodiment of the invention incorporating a slide out top arm rest with tray holder. This arrangement is desirable in some applications, since the tray will be somewhat lower, and greater stability is given to the armrest. The same reference numerals used in FIGS. 1-6 are used in describing the embodiment of FIGS. 7 and 8, where applicable.

In FIGS. 7 and 8 each arm 122 of the seat has the stationary arm rest 144 held thereon by suitable fasteners (not shown). A pair of pins 124 and 126 are held in the arm 122 with the ends of the pins extending outwardly from each side of the arm.

The upper armrest and tray-holding member 140 includes a lower channel or shell member 150 having a pair of slots or grooves 154 and 156 formed therein. Each slot 154 extends substantially the length of the shell and has a generally horizontal forward portion 154a, an inclined center portion 154b which forms the slot's major portion, and a keyed end portion 154c. The extending ends of a pin 124 ride in the slot 154. Slot 156 is located at the rear end of the shell 150 and extends for only about a third of the shell length. The slot 156 is generally parallel to the upper face of the arm 122. The ends of pin 126 ride in the slots 156.

A padded upper armrest 164 is fastened to a bracket 163 by suitable fasteners (not shown) and the bracket is in turn connected to the upper face of the shell 150 by a hinge 186. Wedge pieces 87 are provided on the underside of the center leg of bracket 163 along its length so that the armrest 164 is supported on the top surface of the center leg of shell 150 in a level position.

When the tray holder 140 is not being used, it is stored in the position shown in FIG. 1. Here the top armrest 164 is available for use by the passenger. The weight of the passenger's arm is supported by the wedge pieces 87.

To use the tray holder, it is only necessary to push or pull it forward. In the first portion of its forward travel the shell 150 is kept generally parallel to the upper face of the arm by the pin 126 and slots 156. After pin 126

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leaves the slots 156, the pin 124 and slots 154 guide the shell on a slightly upwardly inclined path so that it can clear the upper end 122a of arm 122 and then rest thereon in a generally horizontal position. As seen in FIG. 7, when the member 140 is fully extended the pin 124 is in the keyed end 154c of slot 154. The member 140 thus can pivot downwardly on pin 124 until the lower face of the center leg of shell 150 engages its supporting surface on the end 122a of the seat arm. This holds the member 140 in a horizontal position with good stability since shell 150 cannot move in any direction. The upper arm rest 164 is then pivoted about its hinge 186 to the dotted line position shown in FIG. 8 where the top face of the center leg of bracket 163 and the wedge pieces 87 are available to hold a tray, 93. When the member 140 is extended the stationary lower armrest 144 is available to the passenger.

To move the member 140 to the stowed position (solid lines of FIG. 7) it is only necessary to fold the top armrest 164 down, push down slightly on the armrest 164 to disengage pin 124 from the keyhole 154c and push or pull back on the shell 150. The shell moves back with pin 124 riding in slot 154. Pin 126 moves into slot 156 during the last portion of the travel of the shell.

In both of the embodiments of the invention shown herein it is possible to move the tray holders and the tray thereon in toward the seat by a slight amount even when a passenger is sitting in the seat. This permits another passenger sitting on a seat inside of the first to have access to the aisle. This is not possible with prior art tray holders of the type connected to the rear of the seat in front of the passenger.

While a preferred embodiment of the invention has been described above it will be understood that this embodiment is illustrative only and the invention is to be limited solely by the appended claims.

What is claimed is:

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1. A tray holder for the arms of a seat, each holder comprising a supporting member having an armrest portion and tray support means, means for mounting said supporting member to said seat arm for pivotally moving said supporting member by rotating the same from a first position where said supporting member is juxtaposed to said seat arm and the armrest portion thereof is exposed to a second position extending said seat arm with said supporting member resting on a portion of said seat arm with access being available to the tray support means, hinge means for mounting the tray support means to said supporting member, said supporting member being formed with a recess, and said hinge means permitting the tray support means to be folded from an open tray supporting position back into said recess to permit the supporting member to be moved to said first position.

2. A tray holder as in claim 1 wherein said means for pivotally moving said supporting member comprises an articulated linkage.

3. The tray-holding arrangement of claim 1 wherein said tray support means comprises a shelf and further comprising projecting means mounted on said shelf for engaging a portion of the tray, which are exposed when the shelf is folded out of the recess.

4. The tray-holding arrangement of claim 3 wherein the shelf of each tray-holding member is formed with an opening therein to permit the shelf to be grasped so that it can be moved from the support member.

References Cited

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U.S. Cl. X.R.

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