United States Patent

Douglas

[15] **3,675,968**

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[54] TABLET ARM ASSEMBLY FOR SEATS

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[30] **Foreign Application Priority Data**

July 11, 1969 Canada 056,775

[52] **U.S. Cl.** **297/162**, 297/154

[51] **Int. Cl.** **A47b 41/00**

[58] **Field of Search** 297/162, 160, 154, 150

[56] **References Cited**

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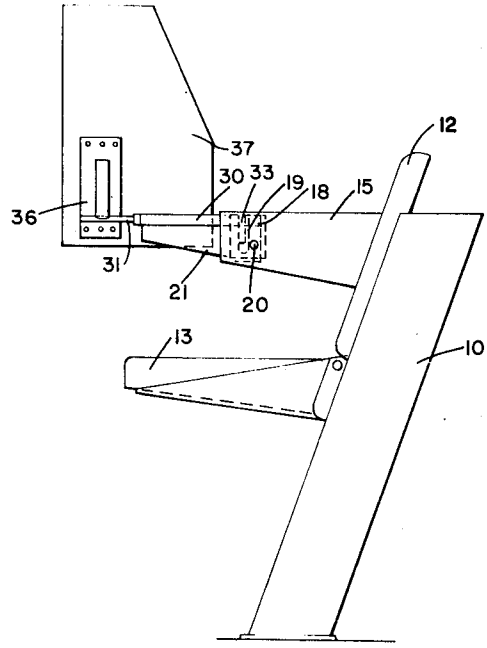
Primary Examiner—James T. McCall

Attorney—Stevens, Davis, Miller & Mosher

[57] **ABSTRACT**

A foldable tablet assembly for the arm rest of a seat of the type including a member pivotally mounted for movement about a first horizontal axis extending transversely of the arm rest, and a tablet member pivotal on said pivotal member about a second axis perpendicular to the said first axis. The present invention provides interengaging means which firstly ensure that the pivotal member is held in a raised position when the tablet is displaced from a vertical plane for movement to a horizontal working position, and secondly the interengaging means maintain the tablet in a vertical plane when the pivotal member is being swung down to the stowed position. The interengaging means include a part, such as a lug, attached to the tablet member, and a fixed surface extending transversely of the arm rest engageable with said part to prevent movement of the pivotal member as the tablet is swung down to the working position.

10 Claims, 6 Drawing Figures



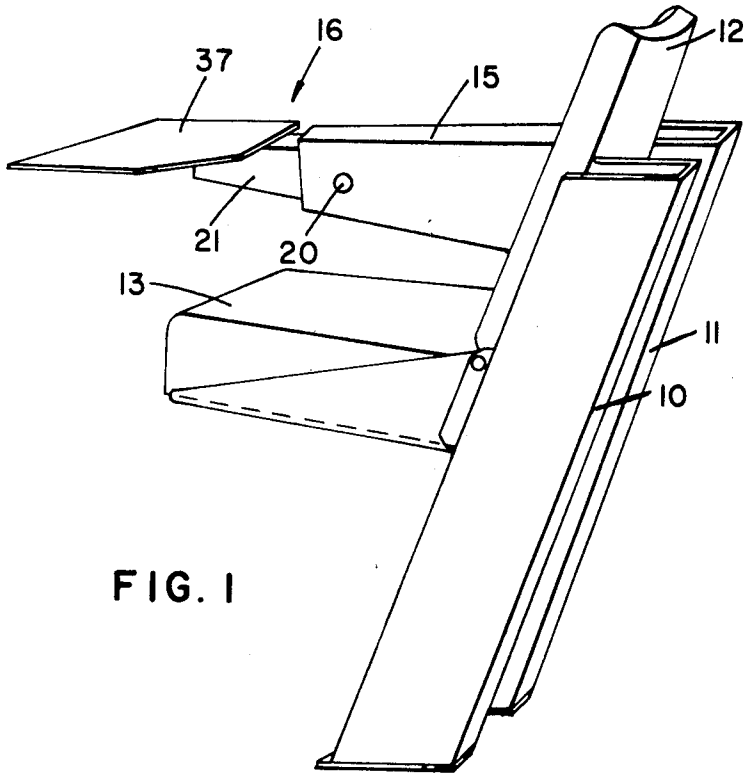


FIG. 1

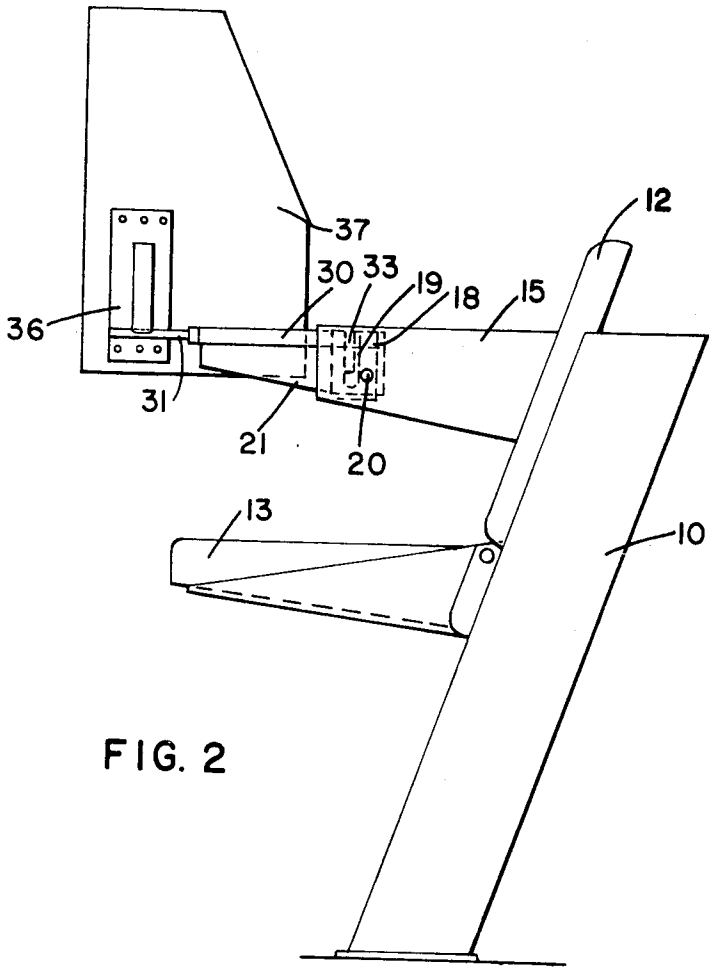


FIG. 2

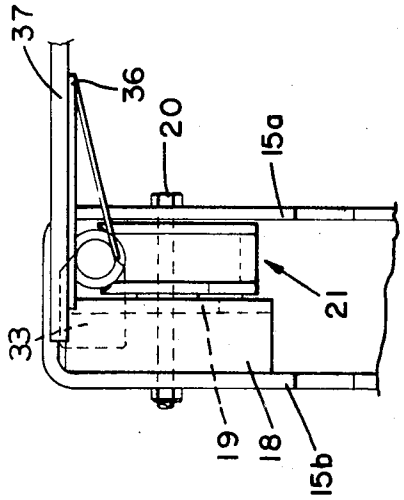

37
36
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15a
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15b

FIG. 4

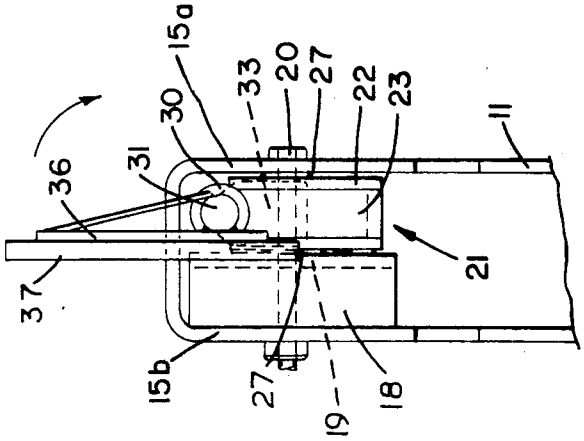

15a
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15b
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FIG. 3

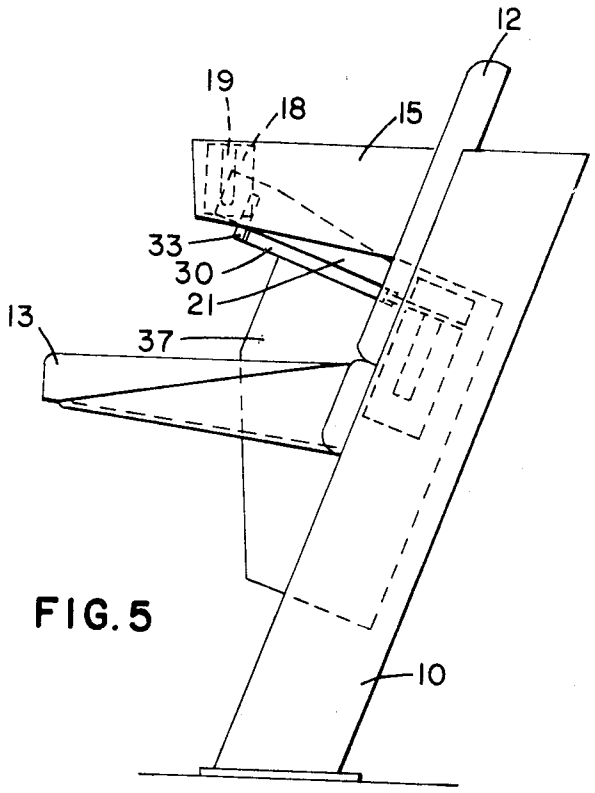


FIG. 5

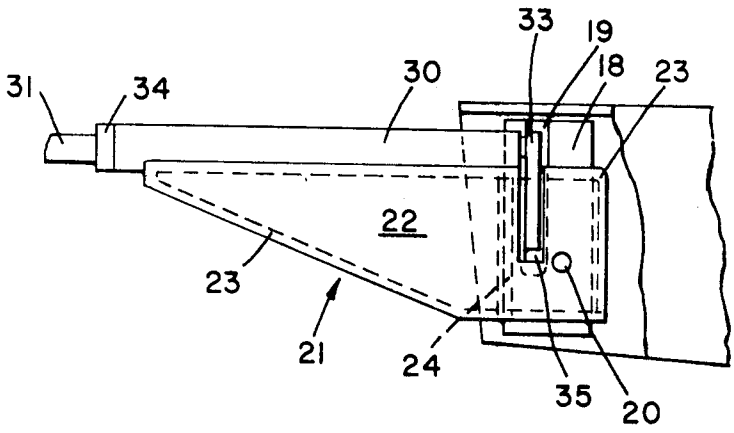


FIG. 6

TABLET ARM ASSEMBLY FOR SEATS

The present invention relates to a foldable tablet arm assembly for the arm rests of seats.

It is known to provide seats, for example seats used in lecture halls or auditoriums, with foldable tablets mounted on the arm rests thereof. The tablets form a supporting surface for note books and the like during lectures, and can be folded away after use so as not to interfere with access to the seats. A particular form of foldable tablet is described in my U.S. Pat. No. 3,297,359.

The present invention has for its main object to provide a foldable tablet assembly generally similar to that described in U.S. Pat. No. 3,297,359, but which is simpler to construct than previous designs and which is stronger and better protected from damage by misuse than previous designs.

According to the present invention, a foldable tablet assembly for the arm rest of a seat comprises a member pivotally mounted for movement about a first horizontal axis extending transversely of the arm rest, said pivotal member being movable from a raised to a stowed position, a tablet member pivotal on said pivotal member about a second axis perpendicular to said first pivotal axis, and interengaging means restricting movement of said assembly, said interengaging means including a fixed surface extending transversely of the arm rest and a part of the tablet member engageable therewith when the pivotal member is raised and when the tablet member is other than substantially vertical, the engagement occurring at locations spaced from said first axis to prevent downwards movement of said pivotal member from its raised position, and said interengaging means also including parts of said tablet member and arm rest engageable with each other to maintain the tablet in a substantially vertical disposition when the pivotal member is displaced downwardly from said raised position.

The term "tablet memer" includes both the actual tablet itself and parts attached thereto and movable therewith. References to the substantially vertical disposition of the tablet member mean that the tablet itself is substantially vertical, say less than 10° from the vertical.

When the pivotal member is in its raised position the tablet can be swung down about said second axis into a horizontal working position in front of the seat, means being provided to prevent the tablet being rotated down below this horizontal position. In this working position the interengaging means prevent movement of the pivotal member so that the tablet is effectively locked in this position. When it is required to stow the tablet, this is raised by rotation about said second axis to a vertical position above the arm rest, causing the interengaging means holding the pivotal member to be disengaged, after which the tablet can be stowed under the arm rest by being swung downwardly about said first axis while still being held by the interengaging means in the vertical plane.

The interengaging means may include a lug forming a part of the tablet member and extending radially of the said second axis, and the arm rest may present a first surface extending transversely thereof and engageable with the lug to hold the pivotal member in its raised position when the tablet member is displaced from the vertical plane, and a second vertical surface parallel to the arm rest which constitutes part of guide means for the lug to hold the tablet member in the vertical plane while the pivotal member is moved to the stowed position. The said first surface need not be flat, but may be for example the vertical edge of a plate member or the side of a groove in a plate member.

In the preferred embodiment, the tablet is stowed into a space formed by a forwards facing recess in the upright support of the arm rest and by a contiguous recess underneath the arm rest. The interengaging means of the present invention ensure that the tablet is fitted correctly into the space, since the interengaging means positively maintains the tablet member in the substantially vertical disposition during stowing.

A preferred embodiment of the invention will now be described in detail with reference to the accompanying drawings, in which:

FIG. 1 shows a perspective view of a seat with a foldable tablet assembly, the tablet being shown in the horizontal working position,

FIG. 2 shows a side elevation of the seat shown in FIG. 1, but with the tablet in the vertical raised position,

FIGS. 3 and 4 show enlarged front views of the tablet assembly and a part of the arm rest support, with the tablet in respectively the raised and lowered (working) position,

FIG. 5 shows a view similar to FIG. 2 but with the tablet stowed, and

FIG. 6 shows an enlarged side view of the tablet arm assembly with the arm rest shown partly broken away.

FIG. 1 of the drawings shows a general view of the seat with the folding tablet. The seat includes two upright supports **10** and **11** constituted by metal channel members having forwardly facing recesses. The supports **10** and **11** are attached to the floor by means described in my U.S. Pat. No. 3,297,359.

On the supports **10** and **11** are mounted a back rest **12** and a tip-up seat portion **13**. The tip-up seat portion is mounted on the adjacent inner flanges of the channel member supports **10** and **11** by hinge means of the type described in my Canadian Pat. No. 738,235. Also mounted on support **11** is shown an arm rest **15** in the form of a metal channel member having a downwards facing recess, which in practice would be provided with a padded top. On this arm rest a foldable tablet assembly indicated at **16** is provided for use by the occupant of the seat.

The seat illustrated is intended to form part of a row of seats, for example in a lecture hall. In this case, the outer flanges of the supports **10** and **11** would be used to mount the seat portions and back rests of adjacent seats, and a further arm rest would be attached to support **10**, this arm rest having a further tablet assembly for use by the person on the adjacent lefthand seat. However, for simplicity, this second arm rest, and the other parts of the adjacent seats which would be attached to the supports **10** and **11**, are not shown in the drawings. It may be noted however that since the adjacent seats, that is to say the back rests and tip-up seat portions, would be attached to the outer flanges only of the supports **10** and **11**, these parts do not interfere with a space which is provided for the stowing of the tablets and which comprises the forwards facing recess of the support members and the downwards facing recess of the arm rests.

The arm rest **15** includes provision for the tablet assembly in the form of a guide member **18** mounted inside the channel member arm rest. As shown in more detail in FIGS. **2** and **3** of the drawings, the guide member **18** is a metal plate bent into the form of a shallow channel, the edges of which are welded to the inside of the outer flange **15***b* of the arm rest. The main part of the guide member **18** presents a fixed flat vertical surface disposed approximately midway between the flanges of the arm rest, and parallel thereto. A vertical groove **19** is provided in the member **18** for a purpose to be described.

The arm rest is also provided with a horizontal transverse bore formed by aligned holes in the arm rest flanges and member **18**, this bore passing behind the groove **19**. This transverse bore carries a pivot bolt **20** on which a pivotal member **21** is rotatably mounted, between the opposed surfaces of the member **18** and the flange **15***a* of the arm rest, the member **21** thus being pivotal about the fixed axis of bolt **20**. As shown in detail in FIG. **6** the pivotal member **21** is a box-like construction formed of parallel side plates **22** held spaced apart by edge strips **23** and a reinforcing strip **24** in a central position. The side plates **22** are transversely drilled to receive the pivot bolt **20** which passes through the flanges of the arm rest. The member **21** as so mounted is rotatable about the pivot bolt **20** through an angle of about 170° from the raised position as shown in FIGS. **1**, **2** and **3**, in which it forms an extension of the arm rest, to a stowed position as shown in FIG. **5** in which it is received between the flanges of the arm rest, the movement between these positions being effected by rotation

of the pivotal member downwardly from the raised position. Friction washers **27** (shown in FIG. **3**) are provided at each side of the member **21** and engage respectively with the opposed surfaces of the guide member **18** and of the flange **15***a* of the arm rest.

As shown in detail in FIGS. **3** and **6**, a tube **30** is welded along the forward upper edge of the side plates **22** of the pivotal member and this tube provides a bearing for a shaft **31** which fits rotatably within the tube **30** and extends perpendicularly to the transverse bolt **20**. The shaft **31** is prevented from sliding in tube **30** by a radially extending lug **33** attached to the rearward end of the shaft and rotatable therewith, and by a washer **34** welded to the shaft at the forward end of tube **30**. A recess **35** is provided in the rearward part of the pivotal member adjacent the lug **33** to allow this lug to rotate without interference.

As shown in FIGS. **2** and **3**, the forward part of shaft **31** carries a bracket **36** brazed thereto, and this bracket **36** carries a wooden writing tablet **37**. As will be clear from FIG. **3**, the tablet **37** is aligned with the lug **33**, and both the lug and the bracket are firmly and non-rotatably fixed to the shaft **31** the whole assembly forming a rotatable tablet member.

It will be seen from FIG. **2** that when the pivotal member **21** is in its raised position as shown, the lug **33** carried by shaft **31** is aligned with the groove **19**. IN this position of the pivotal member the tablet can be swung down about the axis of shaft **31** in the direction of the arrow in FIG. **3** to a horizontal working position, with the lug **33** moving in the groove **19**. In the working position, the lug **33** engages underneath the top of the arm rest, to prevent movement of the tablet below this horizontal position. Also, when the pivotal member is in its raised position and when the tablet member is other than substantially vertical, the face of lug **33** engages on the rearwards facing surface of groove **19** at locations spaced from the axis of bolt **20**, so preventing the pivotal member from swinging down. Accordingly, the tablet is locked in this working position.

When it is desired to stow the tablet this is raised again to the vertically orientated position of FIGS. **2** and **3**, bringing the lug **33** out of engagement with the groove **19**. In this position the pivotal member is held against falling under the weight of the tablet assembly by the friction between the washers **27** and the engaging surfaces of the arm rest. The pivotal member can however readily be rotated about the pivot bolt **20** to reach the position shown in FIG. **5**, in which the tablet is partially received within the forwards facing recess of the support **11** and within the downwards facing recess of the arm rest, and in this position the pivotal member is also held by the friction between the friction washers and the arm rest. During this stowing movement, the tablet is prevented from being displaced from the vertical orientation by any substantial amount by engagement between the sides of lug **33** and the opposed flat surfaces of the guide member **18** and the flange **15***a* of the arm rest, which provide a guideway for the lug.

The interengaging means constituted by the guide member **18** and lug **33** serves a dual purpose in that firstly the engagement between the rearwards facing surface of groove **19** and the face of lug **33** holds the pivotal member in its raised position when the tablet is in the working position, and in that secondly the engagement of the outer face of member **18** on the side of lug **33** provides part of the guideway preventing movement of the tablet from the vertical plane when the pivotal member is being moved. The guidance of the lug **33** between the opposed surfaces of member **18** and flange **15***a* is important in that it ensures that the tablet is fitted correctly into the recess of the support, and cannot be misused by being jammed against one of the flanges of the support.

It will be apparent that only the outer side of groove **19**, i.e., the rearwards facing surface, has a function in accordance with the invention, and therefore the same result could be achieved by the use of a guide member or a part solid with the arm rest having a rearwards facing surface in a position similar to that of the outer side of the groove. Also, instead of the provision of guide member **18**, with a different position of the pivotal member in the arm rest the lug **33** could be designed to engage in a groove in the side flange of the arm rest, guard means being provided to prevent the lug interfering with the person sitting on the adjacent right-hand seat.

The assembly in accordance with the invention is simple to construct, requiring no spring devices, and is also very strong and not susceptible to damage by misuse. Also, the tablet folds away neatly so as not to interfere with the movement of a person from his seat, and in the stowed position the tablet lies entirely behind the pivot point constituted by bolt **20**.

In this preferred embodiment, the pivot for pivotal member **21** is horizontal, so that the tablet **37** moves in a substantially vertical plane, depending on the clearance between the sides of lug **33** and the adjacent surfaces of flange **15***a* and guide member **18**. However, seats may be designed with side supports set at a slight angle to the vertical, in which case the pivot for pivotal member **21** is similarly inclined to the horizontal to allow the tablet to be stowed at the same inclination as that of the supports. References to "horizontal" and "vertical" in the claims are therefore to be understood as not being exact terms where inclined supports are used.

I claim:

1. A foldable tablet assembly for the arm rest of a seat, comprising; a member pivotally mounted for movement about a fixed first horizontal axis extending transversely of said arm rest, said pivotal member being movable from a raised operative position to a stowed position, the movement between said positions being effected by rotation of the pivotal member downwardly from said raised position, a tablet member pivotal on said pivotal member about a second axis perpendicular to said first pivotal axis, and interengaging means restricting and guiding movement of said assembly, said interengaging means including:

a. a fixed surface extending transversely of the arm rest and a part of the tablet member engageable therewith when the pivotal member is in its raised operative position and when the tablet member is other than substantially vertical, the engagement occurring at locations spaced from said first axis to prevent downwards movement of said pivotal member from its raised position when said tablet member is other than substantially vertical, and

b. a fixed vertical surface extending longitudinally of the arm rest and engageable with a part of said tablet member and forming guide means to maintain the tablet in a substantially vertical disposition when the pivotal member is displaced downwardly from said raised position.

2. A foldable tablet assembly according to claim **1**, wherein said interengaging means comprise a lug forming part of the tablet member and extending radially of the said second axis, and wherein the arm rest presents a first surface extending transversely thereof and engageable with the lug to hold the pivotal member in its raised position when the tablet member is substantially displaced from the vertical plane, and a second vertical surface parallel to the arm rest which constitutes part of guide means which co-act with the lug to hold the tablet member in a substantially vertical plane while the pivotal member is moved downwardly from the raised to the stowed position.

3. A foldable tablet assembly according to claim **2**, wherein said tablet member includes a shaft rotatable on said pivotal member about said second axis, and wherein said shaft also carries said lug.

4. A tablet assembly according to claim **2**, wherein the arm rest includes a guide member fixed thereto and having a rearwards facing transverse surface against which the lug is engageable when the pivotal member is raised and when the tablet member is displaced from the vertical position.

5. A tablet assembly according to claim **2**, wherein the said lug also engages with a part of said arm rest to prevent rotation of the tablet member below the horizontal working position.

6. A seat having an arm rest equipped with a foldable tablet assembly according to claim **1**.

7. A seat having an arm rest equipped with a foldable tablet assembly according to claim 1, wherein the said arm rest is formed as a channel member having its recess facing downwardly, and wherein a guide member is secured internally to one of the flanges of the arm rest, said guide member having a first transverse surface facing rearwardly of the seat and a second surface lying in a vertical plane parallel to the flanges of the arm rest, part of said pivotal member being movably disposed between said second surface and the opposed inner surface of the arm rest flange, and wherein said opposed surfaces provide guide means for a lug forming part of said tablet member, said guide means engaging said lug to hold the tablet member substantially vertical while the pivotal member is moved to or from its raised position, and said first surface engaging with said lug to prevent movement of the pivotal member from the raised position while the tablet member is swung about said second axis from the vertical position.

8. A seat according to claim 7, wherein said guide member comprises a bent plate having opposite edges thereof secured internally of the arm rest, said rearwardly facing surface being constituted by one edge of a vertical groove in said plate.

9. A seat having an arm rest equipped with a foldable tablet assembly, wherein said arm rest is formed as a channel member having its recess facing downwardly, said tablet assembly comprising a member pivotally mounted for movement about a first horizontal axis extending transversely of said arm rest, said pivotal member being movable from a raised to a stowed position, a tablet member pivotal on said pivotal member about a second axis perpendicular to said first pivotal axis, and interengaging means restricting movement of said assembly, said interengaging means including a guide member secured internally to one of the flanges of the arm rest, said guide member having a first transverse surface facing rearwardly of the seat and a second surface lying in a vertical plane parallel to the flanges of the arm rest, part of said pivotal member being movably disposed between said second surface and the opposed inner surface of the arm rest flange, said interengaging means also comprising a lug forming a part of said tablet member, said first surface engaging with said lug when the pivotal member is raised and when the tablet member is other than substantially vertical, the engagement occurring at locations spaced from said first axis to prevent downwards movement of the pivotal member from its raised position while the tablet member is swung down about said second axis from the vertical position, and wherein said second surface and the opposed inner surface of the arm rest flange provide guide means engaging said lug to hold the tablet member substantially vertical while the pivotal member is moved to or from its raised position.

10. A seat according to claim 9, wherein said guide member comprises a bent plate having opposite edges thereof secured internally of the arm rest, said rearwardly facing surface being constituted by one edge of a vertical groove in said plate.

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