Nov. 7, 1967 L. L. ANDERSON 3,351,377

FOLDABLE TABLET ASSEMBLY

Filed Sept. 26, 1966 3 Sheets-Sheet 1

Fig. 1

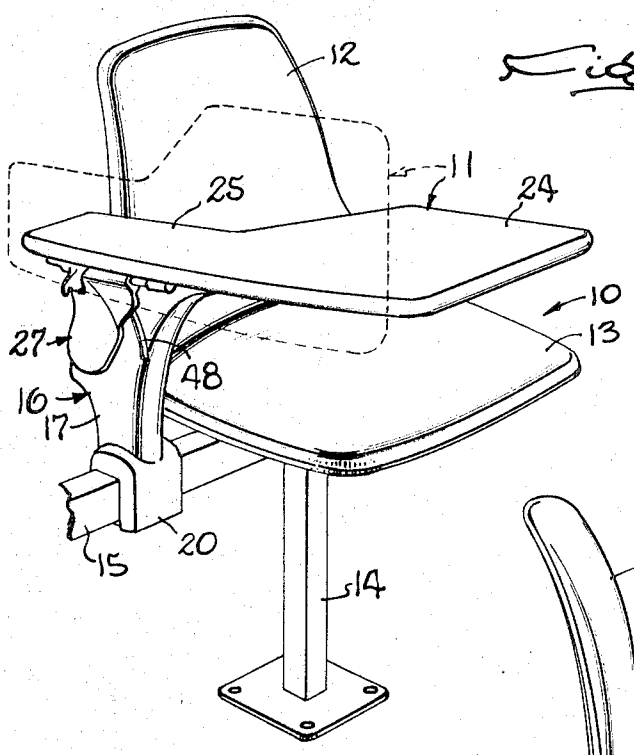


Fig. 3

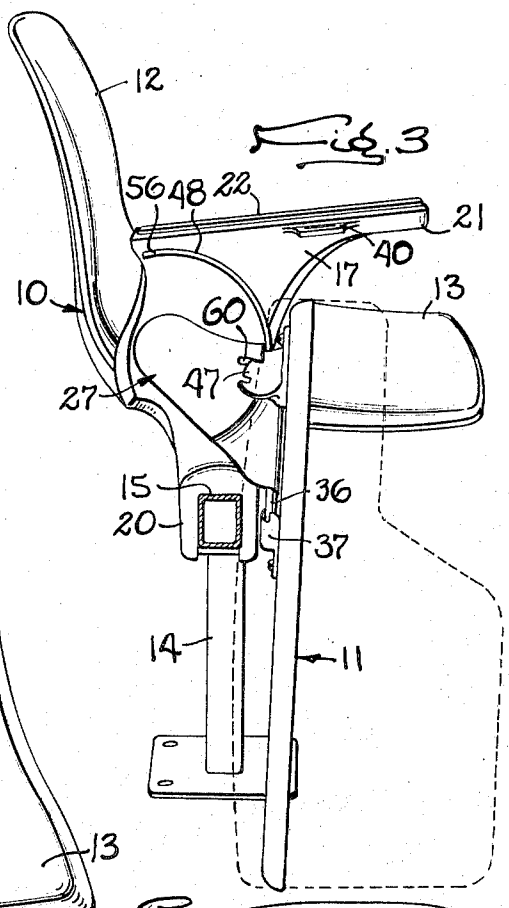
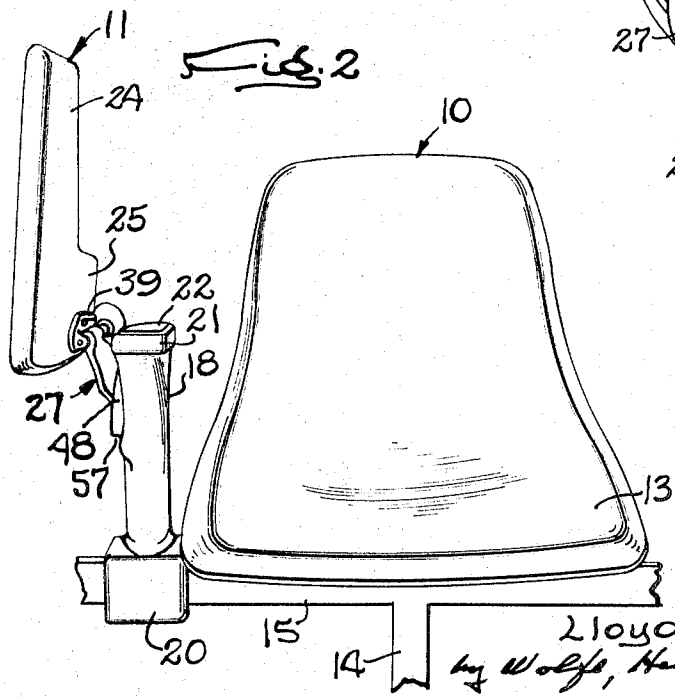


Fig. 2



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FOLDABLE TABLET ASSEMBLY

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Fig. 4

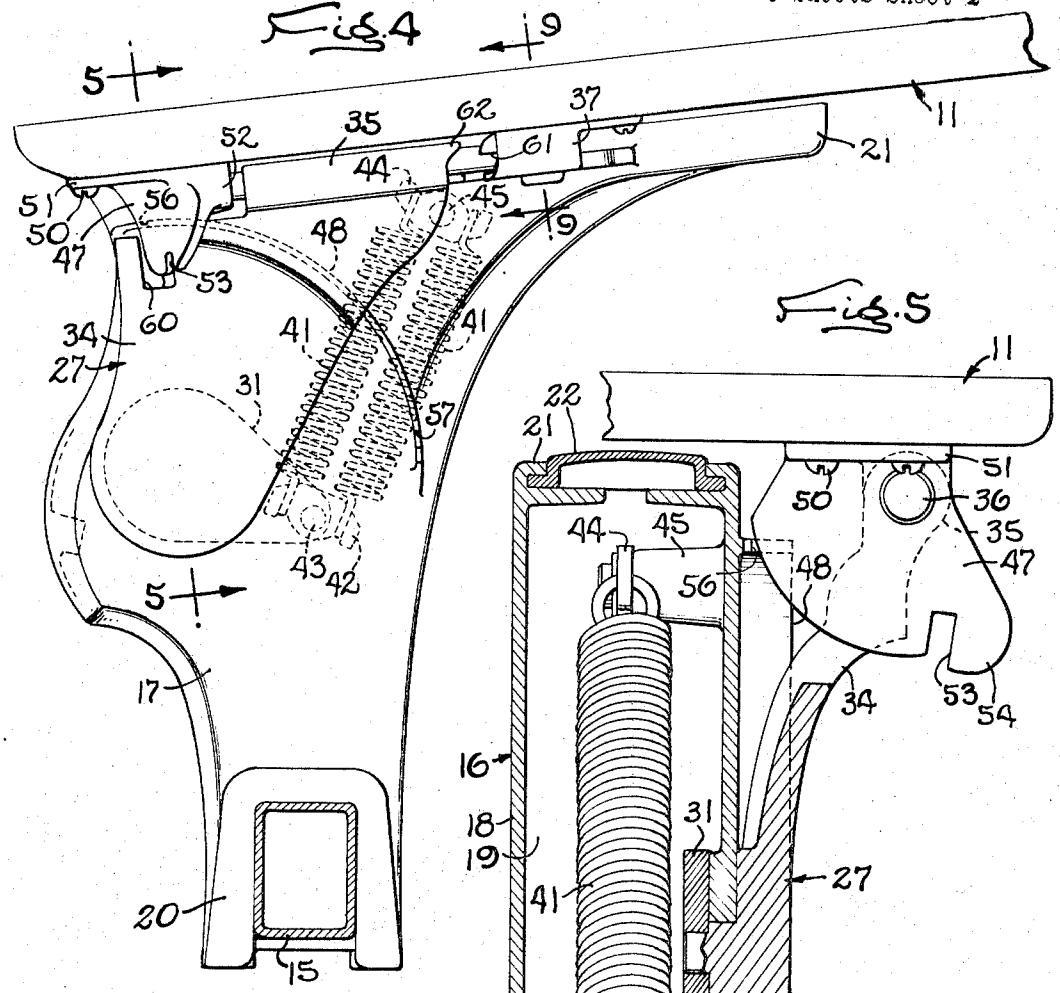
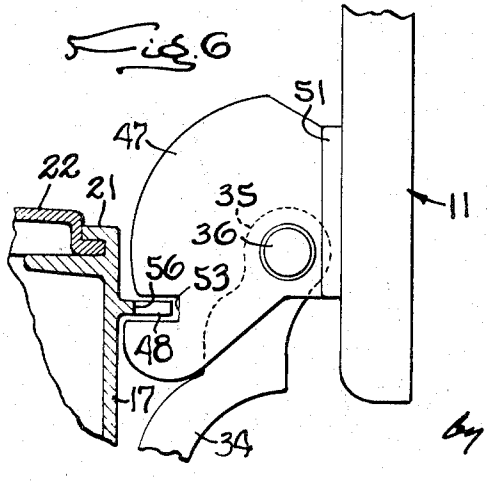


Fig. 5

Fig. 6



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FOLDABLE TABLET ASSEMBLY

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Fig. 7

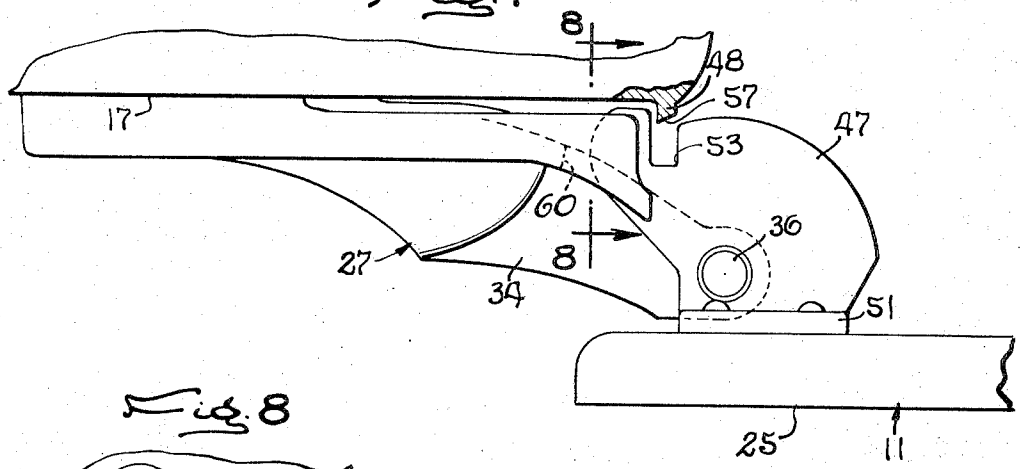


Fig. 8

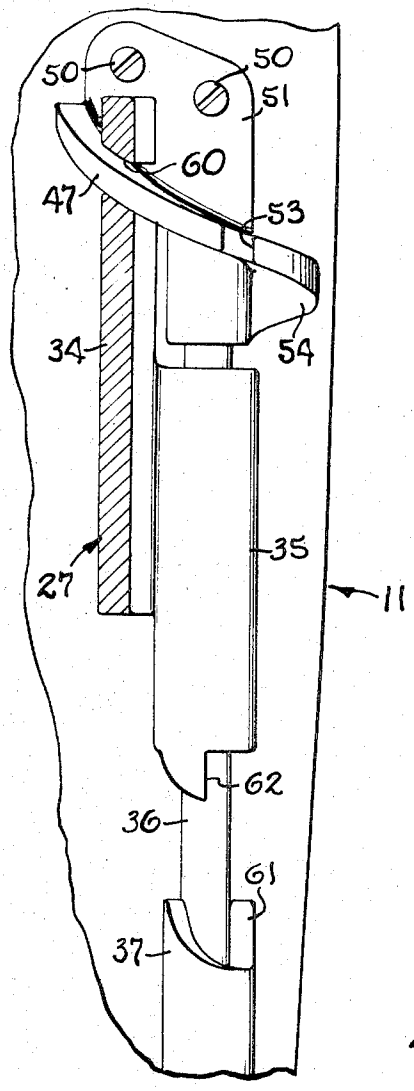
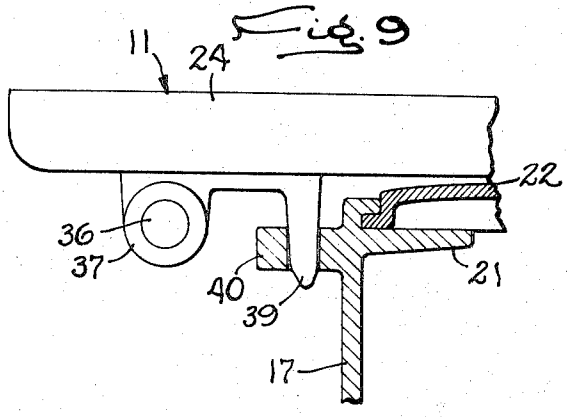


Fig. 9



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United States Patent Office 3,351,377 Patented Nov. 7, 1967

3,351,377

FOLDABLE TABLET ASSEMBLY

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Filed Sept. 26, 1966, Ser. No. 581,986
11 Claims. (Cl. 297—162)

This invention relates to a foldable tablet assembly for use with a chair unit such as found in schools, auditoriums and lecture rooms and, more particularly, to a tablet assembly of the type in which the tablet may be turned upwardly from a horizontal writing position to a raised position disposed at one side of and above the chair seat, swung downwardly and edgewise along the edge of the seat to a lowered position hanging at the side of the seat, and then turned inwardly to a non-obstructive stored position in which the major portion of the tablet underlies the seat. The tablet travels along the same paths but in opposite directions as it is returned from the stored position to the writing position.

The primary object of the present invention is to lock the tablet for movement along predetermined paths of travel as it is turned and swung between the various positions and thereby avoid damaging abrasive contact between the tablet and the stationary elements of the chair unit during such movement.

A related object is to maintain the tablet spaced from the seat and the arm rest of the chair unit at all times during movement of the tablet between its writing and stored positions.

A more detailed object is to provide cooperating guide elements on the tablet and its support to restrict swinging of the tablet while it is being turned and to restrict turning of the tablet while it is being swung.

A further object is to utilize the weight of the tablet for turning the latter to its stored position automatically as an incident to reaching its lowered position.

Other objects and advantages of the invention will become apparent from the following detailed description taken in connection with the accompanying drawings, in which:

FIGURE 1 is a perspective view of a chair unit having a tablet assembly incorporating the novel features of the present invention.

FIG. 2 is a front elevation of the unit and assembly but showing the tablet in a moved position.

FIG. 3 is a side elevation of the unit and assembly but showing the tablet in another moved position.

FIG. 4 is an enlarged fragmentary side elevation of the tablet assembly.

FIG. 5 is an enlarged fragmentary cross-section taken substantially along the line 5—5 of FIG. 4.

FIG. 6 is a fragmentary elevational view of parts illustrated in FIG. 5 and showing the tablet in a moved position.

FIG. 7 is a fragmentary plan view of parts illustrated in FIG. 6 and showing the tablet in another moved position.

FIG. 8 is an enlarged fragmentary cross-section taken substantially along the line 8—8 of FIG. 7 and showing the parts in moved positions.

FIG. 9 is an enlarged fragmentary cross-section taken substantially along the line 9—9 of FIG. 4.

As shown in the drawings for purposes of illustration, the invention is embodied in a foldable tablet assembly installed alongside a chair 10 of the type especially used in schools and auditoriums. The assembly includes a tablet 11 which may be positioned substantially horizontally as shown in FIG. 1 to serve as a support for reading and writing materials as well as the arm of the user, and

which may be folded to an upright stored position (FIG. 3) when not in use to enhance the appearance of the room and to provide increased seating comfort and aisle space.

In this instance, the chair 10 is of one-piece fiberglass construction and includes a contoured back rest 12 and a bucket-type seat 13 supported on an upright post 14 fastened to the floor of the room. Extending beneath the seat and over the top of the post is a long metal rail 15 of rectangular cross-section mounting a hollow casing 16 for supporting the tablet 11. The casing is formed by a pair of substantially vertical side plates 17 and 18 which preferably are zinc castings suitably fastened together in laterally spaced relationship to define an enclosed interior 19 (FIG. 5). At their lower ends, the plates are formed with U-shaped yokes 20 which fit over and are clamped to the rail. The upper ends of the plates extend parallel to the seat and are shaped to form a horizontal arm rest 21 supporting a cushioning pad 22 (FIG. 5). Usually, a number of chairs are arranged in a row extending parallel to the rail and each tablet assembly is supported on the rail adjacent its respective chair.

As shown in FIG. 1, the tablet 11 is formed with a relatively wide writing portion 24 spaced above and overlying the seat 13, and with a narrower neck portion 25 disposed on the arm rest 21 when the tablet is in its horizontal writing position. The tablet is mounted for turning on an arm 27 which, in turn, is fulcrumed on the outer side plate 17 to swing upwardly and downwardly about a horizontal axis. To move the tablet to the stored position, it first is turned upwardly relative to the arm from the writing position to a raised position shown in FIG. 2 in which the tablet is disposed at one side of and above the arm rest and the seat. The tablet next is swung edgewise and downwardly with the arm 27 to a lowered position hanging by the side of the seat as shown in broken lines in FIG. 3. Finally, the tablet is turned relative to the arm about an upright axis to the stored position (shown in solid lines in FIG. 3) in which the tablet is generally parallel to the chair back 12 and the writing portion 24 underlies the seat. In the latter position, the tablet allows easy entrance to and exit from the chair and also is disposed advantageously to enable passage of a floor-cleaning implement along the row of chairs. The tablet moves along the same paths but in opposite directions as it is returned to the writing position.

More specifically, the arm 27 is made of rugged material such as Zamak and is formed with an inwardly projecting circular hub 30 (FIG. 5) journaled for rotation in an opening formed in the outer side plate 17 of the casing 16. A retaining disk 31 disposed within the interior 19 of the housing holds the arm on the side plate and is mounted for rotation with the hub by a series of circumferentially spaced driving lugs 32 formed integrally with the hub and projecting inwardly through holes in the disk. The disk and the hub are held together by a retaining ring (not shown) on the inner end of a pin 33 extending through the center of the disk and hub.

Flaring gradually upwardly and outwardly from the hub 30 is an arm extension 34 (FIG. 5) formed with a hinge boss 35 at its free end rotatably and slidably receiving a cylindrical hinge rod 36. The forward end of the hinge rod is telescoped into and anchored within a mounting sleeve 37 fastened to the underside of the tablet 11 by screws. Thus, when the arm 27 is disposed in the upper position shown in FIGS. 1 and 4, the hinge rod 36 is substantially horizontal and the tablet may be turned upwardly about the axis of the rod from the writing position to the raised position. As the tablet is swung downwardly to the lowered position, the arm swings about the axis of the hub 30 to a lower position (FIG. 3) in which the hinge rod is disposed vertically so that the tablet may

be turned inwardly about the hinge rod to the stored position.

To stabilize the tablet **11** in the writing position, a pair of latching members **39** and **40** (FIG. 9) on the tablet and the side plate **17**, respectively, coact to prevent objectionable sideways motion of the tablet which otherwise might result because of looseness between the hub **33** and the side plate. The latching member **39** is a hook formed integrally with the sleeve **37** and projecting into the latching member **40** which herein is simply an eye formed on the upper portion of the side plate **17** near the arm rest **21**. The hook **39** automatically turns into and out of latching engagement with the eye **40** as the tablet is turned between the writing and raised positions.

Preferably, the tablet **11** is counterbalanced by a pair of contractile springs **41** (FIGS. 4 and 5) as the arm **27** is swung between the upper and lower positions. The springs are disposed side-by-side within the interior **19** of the casing **16** and are connected at one end to a yoke **42** secured to a crank pin **43** fast on an eccentric extension of the retaining disk **31**. At their opposite ends, the springs are anchored to a similar yoke **44** fastened on an inwardly projecting boss **45** formed integrally with the side plate **17**. Thus, the springs are stretched as the arm and the tablet are swung downwardly and thereby counterbalance the weight of these members. In addition, the springs contract as the arm and the tablet are swung upwardly to assist in raising the tablet from its lowered position.

In accordance with the primary aspect of the present invention, the tablet **11** is locked and guided for movement in predetermined paths spaced from the seat **13** and the arm rest **21** as it is turned and swung between the various positions thereby to insure that the tablet will not scrape and scuff against the chair elements during such movement. To this end, the tablet carries a stop or guide element **47** which cooperates with a guide element **48** on the outer side plate **17** to restrict swinging of the arm **27** while the tablet is being turned about the axis of the hinge rod **36** and also to restrict turning of the tablet while the arm is being swung upwardly and downwardly. Accordingly, scratching, scarring and other damage which otherwise would be caused by the tablet and the chair rubbing together are eliminated not only because the tablet must always be spaced from the chair **10** before it can be moved between the various positions but also because the tablet is positively guided while it is being moved.

In the present instance, the guide element **47** comprises a substantially upright plate fastened to the underside of the neck portion **25** of the tablet **11** by screws **50** extending through a mounting wing **51** (FIGS. 4 and 5) integral with and disposed approximately at a right angle to the plate. At its forward end, the guide element is formed with a forwardly opening eye **52** (FIG. 4) which receives the rear end portion of the hinge rod **36**. As shown in FIG. 5, the lower edge of the plate is arcuately curved about the axis of the hinge rod and is formed with a notch **53** which is defined in part by an ear **54** at the lower right hand corner of the plate **47**.

Herein, the guide element **48** is a laterally projecting rib formed integrally with the outer side plate **17** of the casing **16** and arcuately curved about the axis of the hub **30**. The rib curves downwardly and forwardly along the side of the plate **17** from a point adjacent the guide plate **47** when the tablet **11** is in the writing position to a point near the front of the casing and level with the axis of the hub. When the tablet is in the writing position and as it is being turned from the writing position to the raised position, the forward side of the guide plate **47** engages the upper end **56** of the rib as shown in FIGS. 4 and 5 to prevent the arm **27** from swinging downwardly. Then, when the tablet has been turned fully to the raised position, the notch **53** in the guide plate registers with the upper end of the rib (see FIG. 6) to allow the arm and the tablet to swing downwardly. As the tablet is swung toward its lowered position, the ear **54** and the wall of notch opposite the ear slide along the rib to guide the tablet and to prevent the latter from turning about the axis of the hinge rod **36**. This insures that the tablet will not rub and scrape against the arm rest **21** and the chair seat **13** during its downward movement. When the tablet reaches its lowered position and the writing portion **24** is disposed well below the seat, the notch in the guide plate registers with a notch **57** (FIGS. 4 and 7) formed near the lower end of the rib thus enabling the guide plate to turn through the latter notch and allowing the tablet to be turned inwardly about the hinge axis to the stored position (FIG. 3).

When the tablet **11** is in the stored position and as it is being turned outwardly to the lowered position, the upper face of the guide plate **47** engages the top wall of the notch **57** in the rib **48** to prevent the arm **27** from swinging upwardly and thus avoiding contact between the writing surface of the tablet and the lower side of the seat **13**. Of course, the tablet may be swung upwardly toward the raised position after it has been turned outwardly sufficiently far to aline the notch **53** in the guide plate with the rib. The rib guides the tablet during its upward movement and, after the notch **53** passes the upper end **56** of the rib, the tablet may be turned inwardly and downwardly to its writing position.

In accordance with another aspect of the present invention, the weight of the tablet **11** is utilized to turn the latter to its stored position automatically as an incident to reaching the lowered position. For this purpose, the guide plate **47** is formed with a helical shape and rotates within a notch **60** (FIGS. 4 and 8) formed in the extension **34** of the arm **27**, the notch being located rearwardly of the hinge boss **35**. As shown most clearly in FIG. 8, the edge portion of the downwardly spiraling plate **47** projects into the notch **60** and coacts with the latter somewhat as a screw thread to cam the tablet inwardly about the axis of the hinge rod **36** as soon as the tablet reaches its lowered position and the notches **53** and **57** are alined with each other. The weight of the tablet is sufficient to supply the actuating force for turning the plate **47** in the notch **60** thus making it unnecessary to turn the tablet manually to the stored position.

Advantage is taken of this arrangement to aline the notch **53** in the guide plate **47** automatically with the upper end **56** of the guide rib **48** as the tablet **11** is raised from the writing position (FIG. 1) to the raised position (FIG. 2). As the tablet is raised, the forward face (FIG. 4) of the helical guide engages the end of the rib and cams the tablet and the hinge rod **36** rearwardly, the hinge rod both rotating and sliding in the hinge boss **35** during such rearward movement. As the tablet is turned upwardly through a sufficient angle to aline the notch **53** with the rib, an abutment in the form of a set of jaws **61** (FIGS. 4 and 8) formed on the rear end of the sleeve **37** engages and meshes with similar set of jaws **62** on the forward end of the stationary boss **35** to restrict further rotation of the arm **27** in a counterclockwise direction (FIG. 2). As a result, the notch **53** cannot be turned beyond the rib and is alined automatically with the latter to allow the tablet to be swung downwardly to its lowered position.

From the foregoing, it will be apparent that the tablet **11** and the chair **10** will retain their original appearance for longer periods of time and will have a much longer service life than prior arragements of a similar nature since the tablet is always free of contact with the chair during movement between the various positions. The guide element **27** not only locks and guides the tablet during such movement but also serves as an operator causing the tablet to turn to its stored position automatically. As a result, the tablet assembly is relatively

simple in construction while being exceptionally maintenance-free in service use.

I claim as my invention:

1. A foldable tablet assembly for use with a chair unit having a substantially horizontally disposed seat, said assembly having, in combination, a support, an arm fulcrumed on said support for swinging about a horizontal axis between upper and lower positions, a tablet having a relatively wide writing portion and a narrower neck portion extending from said writing portion, a pivot member disposed in a substantially horizontal position when said arm is in said upper position and mounting said tablet on said arm for swinging about a second substantially horizontal axis transverse to said first axis between a substantially horizontal writing position in which aid writing portion overlies the seat and a raised position in which said writing portion is spaced laterally of and above one edge of the seat, said tablet and said pivot member being movable bodily with said arm as the latter is swung between said upper and lower positions whereby the tablet is swingable edgewise between said raised position and a lowered position in which said writing portion is spaced laterally of and below the seat, said pivot member being disposed in an upright position when said arm is in said lower position and mounting said tablet for turning relative to said arm between said lowered position and a stored position in which said writing portion underlies the seat, a guide rib on said support and arcuately curved about said first axis, a plate having the shape of a helix turnable with said tablet and engageable with said rib to restrict swinging of said arm between said upper and lower positions while said tablet is being turned toward and away from said writing and stored positions, said plate having one edge thereof alined with said rib when said tablet is in said raised and lowered positions to leave said arm free for swinging movement between said upper and lower positions, said edge overlying and being slidable along and engageable with said rib while said arm is being swung between said upper and lower positions to restrict turning of said tablet relative to said arm and to maintain the tablet spaced laterally from the one edge of the chair, and means on said support coacting with said plate and operable to cause said tablet to turn from said lowered position to said stored position automatically as an incident to said arm reaching said lower position.

2. A tablet assembly as defined in claim 1 in which said plate engages said rib to cam said tablet rearwardly relative to said arm as the tablet is turned from said writing position to said raised position, and opposed abutments on said tablet and said arm engageable with each other as an incident to said rearward movement to restrict turning movement of the tablet beyond said raised position and thereby automatically aline said one edge of said plate with said rib.

3. A foldable tablet assembly for use with a chair unit having a substantially horizontally disposed seat, said assembly having, in combination, a support, an arm fulcrumed on said support to swing about a predetermined axis between upper and lower positions, a tablet having a writing portion, a pivot member disposed substantially horizontally when said arm is in said upper position and mounting said tablet on said arm for turning about an axis transverse to said one axis between a substantially horizontal writing position in which said writing portion overlies the seat and a raised position in which the writing portion is spaced laterally of and above one edge of the seat, said tablet being movable bodily with said arm as the latter is swung between said upper and lower positions and being swingable edgewise between said raised position and a lowered position in which the writing portion is spaced laterally of and below the one edge of the seat, a first guide element on said support and arcuately curved about said one axis, and a second guide element carried by said tablet and abutting against said

first guide element as said tablet is turned between said writing and raised positions to restrict swinging of said arm from said upper to said lower positions and sliding along said first guide element as said arm is swung between said upper and lower positions to restrict turning of said tablet relative to the arm and to maintain the tablet spaced from the edge of the seat during such swinging.

4. A tablet assembly as defined in claim 3 in which said first guide element is a rib arcuately curved about said first axis, and said second guide element comprises a plate turnable with said tablet and abutting against an edge portion of the rib as the tablet is turned between said writing and raised positions to restrict swinging of said arm from said upper to said lower positions, said plate having one edge thereof alined with said rib when said tablet is in said raised position, and said edge being slidable along and engageable with said rib as said tablet is swung from said raised position to said lowered position to restrict turning of the tablet relative to the arm.

5. A tablet assembly as defined in claim 3 further including a latching member on said tablet engageable with a complementary latching member on the upper and forward end portion of said support when said tablet is in said writing position to restrict swinging movement of the tablet about an upright axis.

6. A tablet assembly as defined in claim 3 in which said second guide element comprises a cam turnable with said tablet and having an edge portion projecting into a notch formed in said arm for causing said tablet to turn from said lowered position to a stored position in which said writing portion underlies the seat automatically as an incident to said arm reaching said lower position.

7. A foldable tablet assembly for use with a chair unit having a substantially horizontally disposed seat, said assembly having, in combination, a support, an arm fulcrumed on said support to swing about a horizontal axis between upper and lower positions, a tablet having a relatively wide writing portion and a narrower neck portion extending from said writing portion, a pivot member disposed substantially horizontally when said arm is in said upper position and mounting said tablet on the free end of the arm for turning about an axis transverse to said one axis between a horizontal substantially writing position in which said writing portion overlies the seat and a raised position in which the writing portion is spaced laterally of and above one edge of the seat, said tablet and said pivot member being mounted for bodily movement with said arm as the latter is swung between said upper and lower positions whereby the tablet is swingable edgewise between said raised position and a lowered position in which said writing portion is spaced laterally of and below the one edge of the seat, said pivot member being disposed in an upright position when said arm is in said lower position and mounting said tablet for turning between said lowered position and a stored position in which said writing portion underlies the seat, and a stop carried by said tablet and engageable with said support to restrict swinging of said arm between said upper and lower positions while said tablet is being turned toward and away from said writing and stored positions and to restrict turning of said tablet relative to said arm while the latter is being swung between said upper and lower positions.

8. A foldable tablet assembly for use with a chair unit having a substantially horizontally disposed seat, said assembly having, in combination, a support, an arm fulcrumed on said support to swing about a horizontal axis between upper and lower positions, a tablet having a relatively wide writing portion and a narrower neck portion extending from said writing portion, a pivot member disposed substantially horizontally when said arm is in said upper position and mounting said tablet on the free end of said arm for turning about a second substantially

horizontal axis between a substantially horizontal writing position in which said writing portion overlies the seat and a raised position in which the writing portion is spaced laterally of and above one edge of the seat, said tablet and said pivot member being mounted for bodily movement with said arm as the latter is swung between said upper and lower positions whereby the tablet is swingable edgewise between said raised position and a lowered position in which said writing portion is spaced laterally of and below the one edge of the seat, said pivot member being disposed in an upright position when said arm is in said lower position and mounting said tablet for turning between said lowered position and a stored position in which said writing portion underlies the seat, and means carried by said tablet and operable in conjunction with the weight of the tablet to cam the tablet about the axis of said pivot member and turn the tablet from said lowered position to said stored position automatically as an incident to the arm reaching said lower position.

9. A tablet assembly as defined in claim **8** in which said means comprises a cam element turnable with said tablet and having an edge portion projecting within a notch formed in said arm.

10. A tablet assembly as defined in claim **9** in which said cam element has the shape of a downwardly spiraling helix when said tablet is in said lowered position.

11. A foldable tablet assembly for use with a chair unit having a substantially horizontally disposed seat, said assembly having, in combination, a support, an arm fulcrumed on said support to swing about a first predetermined axis between upper and lower positions, a tablet having a writing portion, a pivot member disposed substantially horizontally when said arm is in said upper position and mounting said tablet on said arm for turning about a second predetermined axis between a substantially horizontal writing position in which said writing portion overlies the seat and a raised position in which the writing portion is spaced laterally of and above one edge of the seat, said tablet being movable bodily with said arm as the latter is swung between said upper and lower positions and being swingable edgewise between said raised position and a lowered position in which the writing portion is spaced laterally of and below the one edge of the seat, a first guide element on said support and arcuately curved about said first axis, and a second guide element carried by said tablet and operable to slide along and engage said first guide element as said arm is swung between said upper and lower positions to restrict turning of said tablet relative to the arm and to maintain the tablet spaced from the edge of the seat during such swinging.

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