March 2, 1971 A. L. VAN RYN 3,567,276

CHAIR WITH FOLDING TABLET ARM

Filed March 24, 1969 3 Sheets-Sheet 1

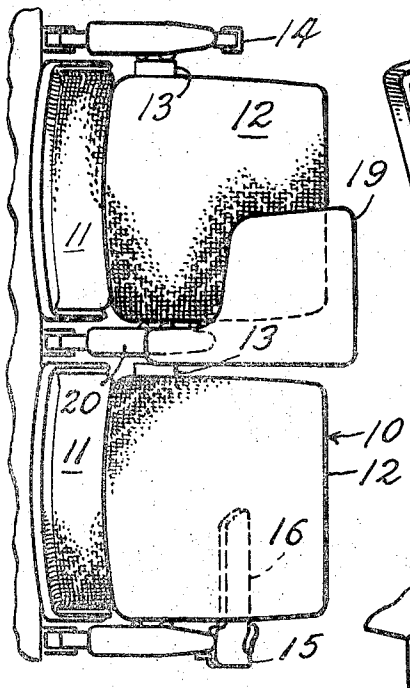


FIG. 1

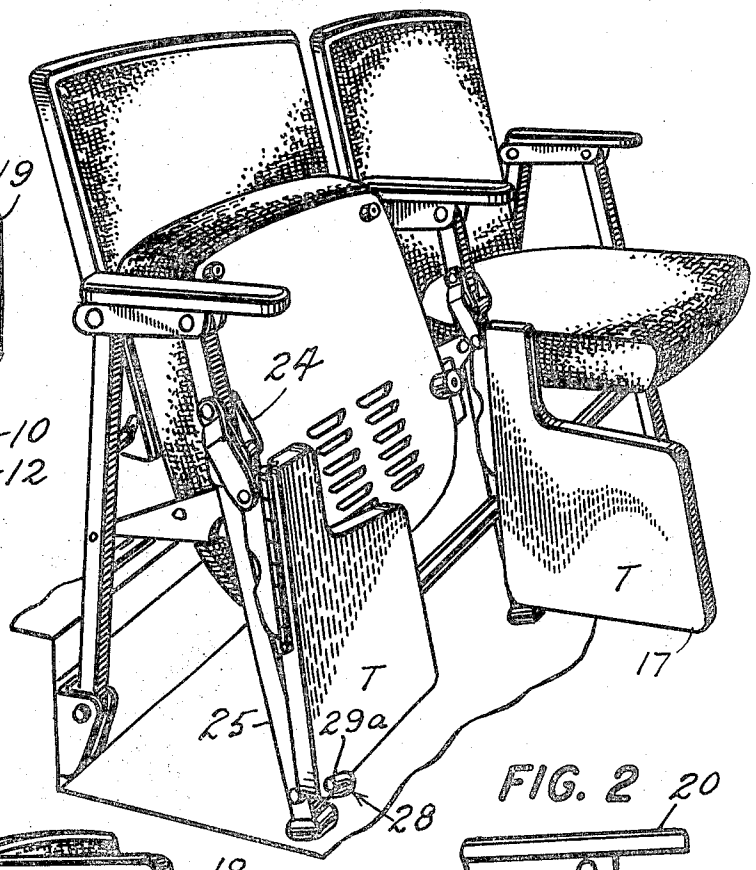


FIG. 2

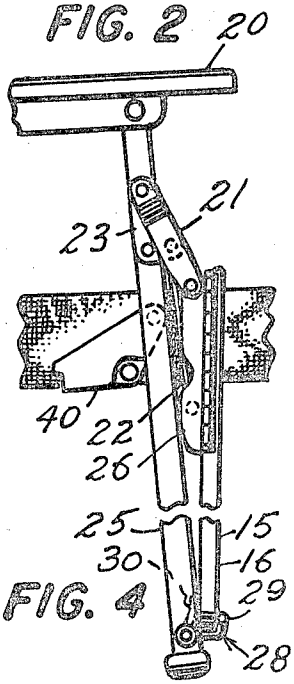


FIG. 4

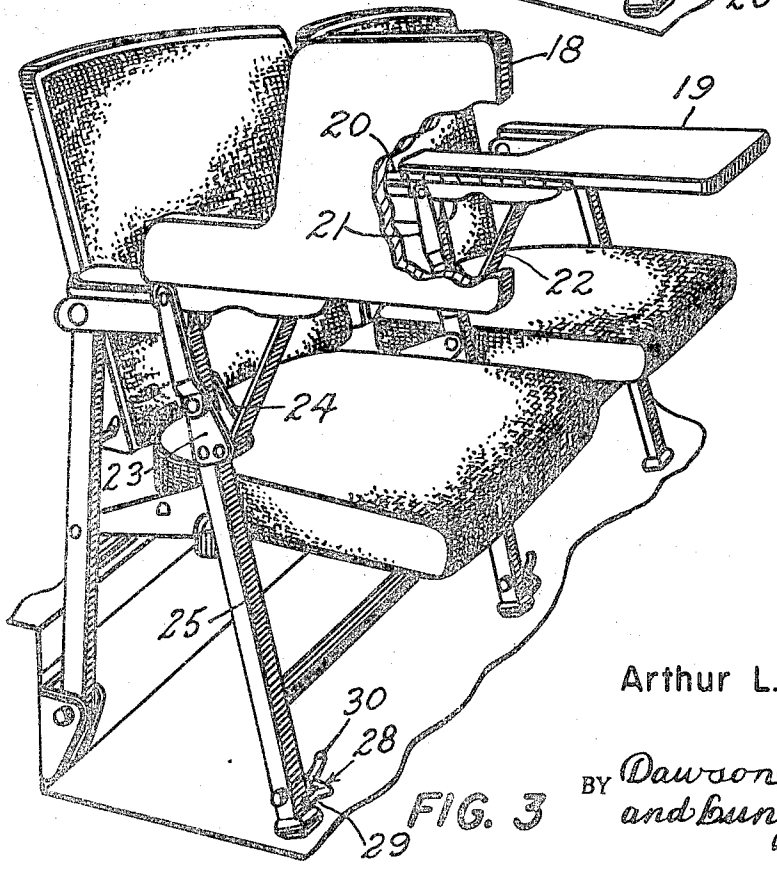


FIG. 3

INVENTOR

Arthur L. Van Ryn

BY Dawson, Tilton, Fallon and Lungmus

ATTORNEYS

March 2, 1971 A. L. VAN RYN 3,567,276

CHAIR WITH FOLDING TABLET ARM

Filed March 24, 1969 3 Sheets-Sheet 2

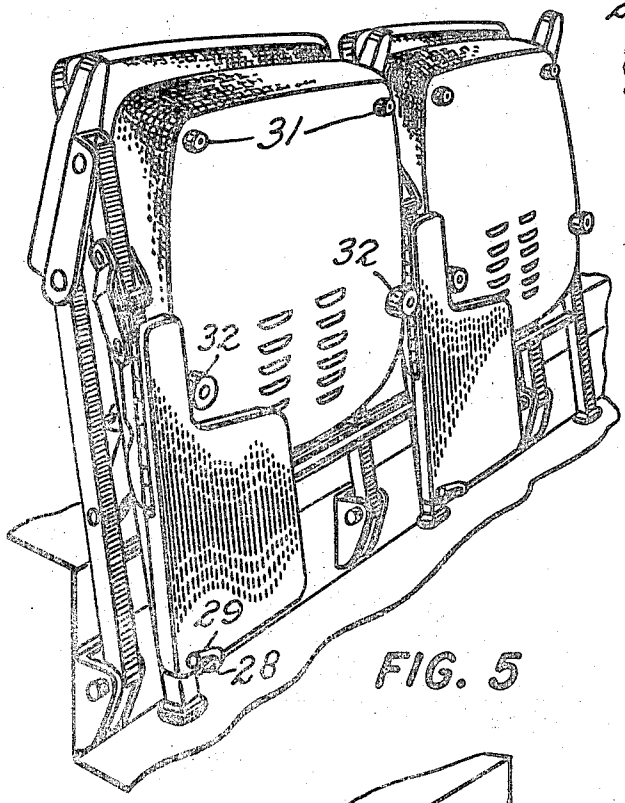


FIG. 5

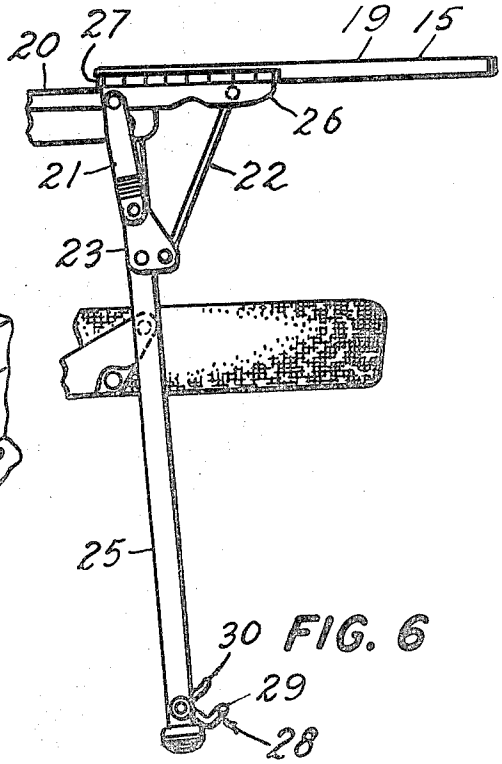


FIG. 6

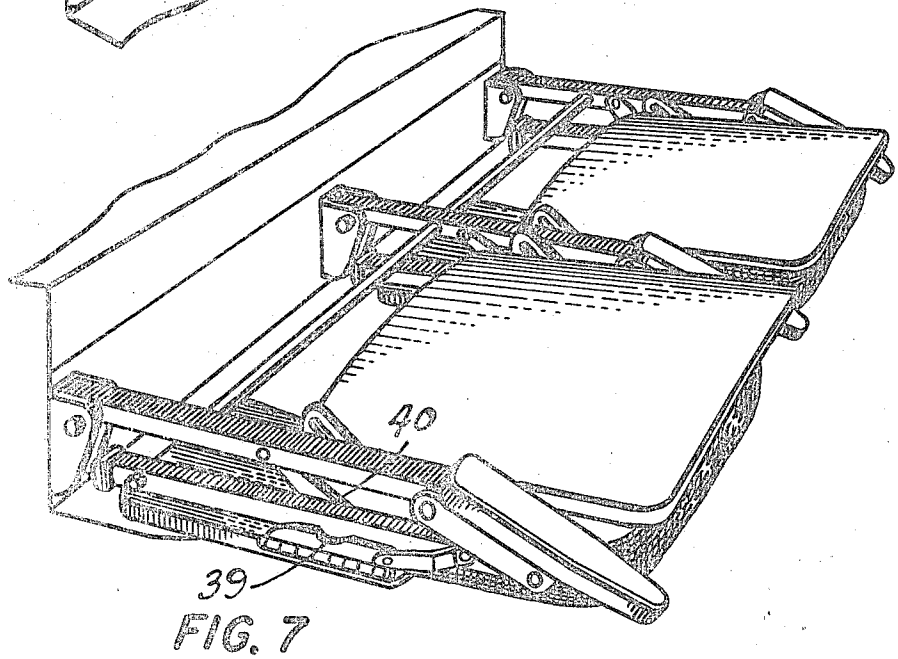


FIG. 7

INVENTOR

Arthur L. Van Ryn

BY Dawson, Tilton, Fallon and Lungmus.

ATTORNEYS

March 2, 1971 A. L. VAN RYN 3,567,276

CHAIR WITH FOLDING TABLET ARM

Filed March 24, 1969 3 Sheets-Sheet 3

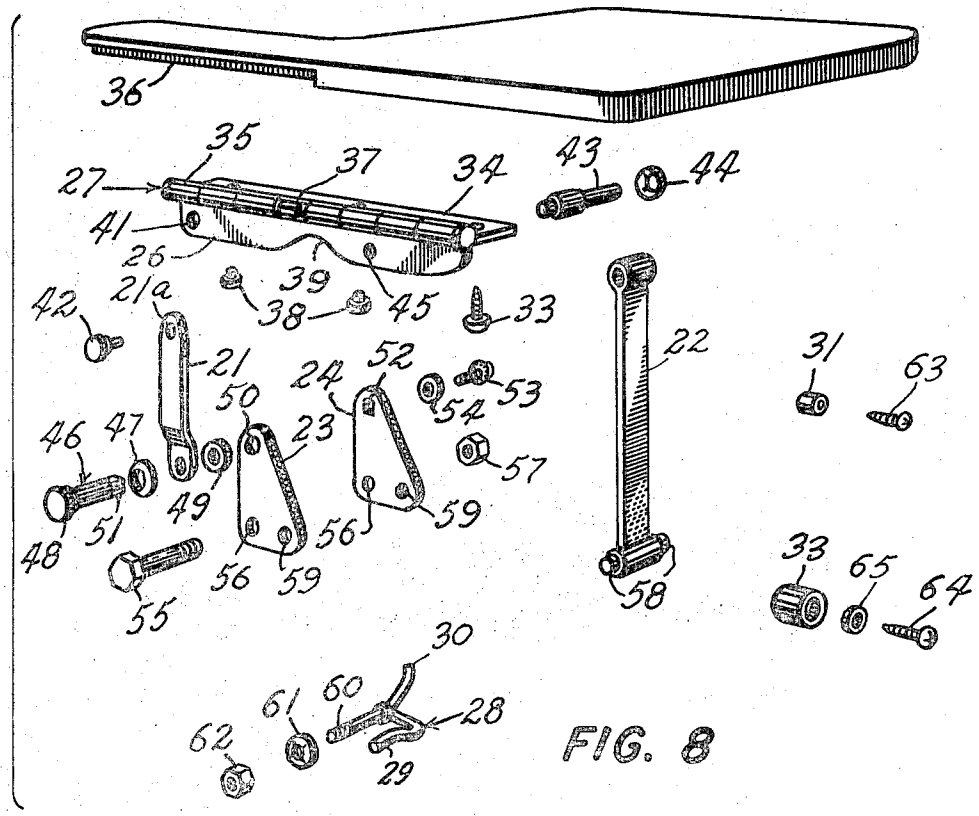


FIG. 8

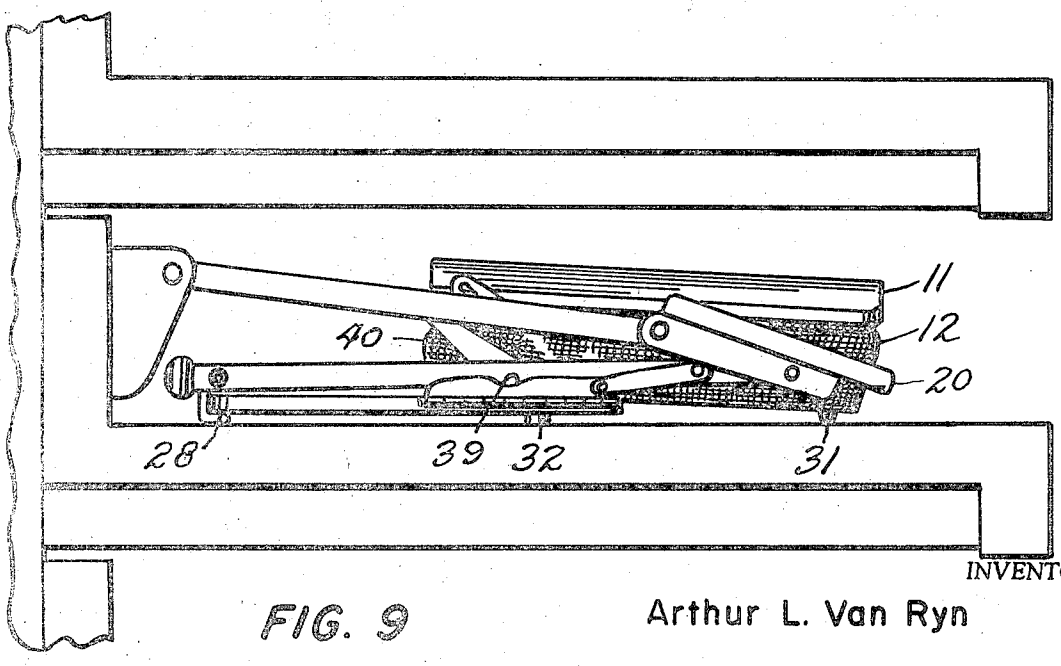


FIG. 9

INVENTOR

Arthur L. Van Ryn

BY Dawson, Tilton, Fallon and Bungmuse

ATTORNEYS

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CHAIR WITH FOLDING TABLET ARM

Arthur L. Van Ryn, Grand Rapids, Mich., assignor to American Seating Company, Grand Rapids, Mich.

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Int. Cl. A47b 39/00
U.S. Cl. 297—162 8 Claims

ABSTRACT OF THE DISCLOSURE

A chair with a folding tablet arm especially adaptable for installation on retractable bleachers where the tablet arm is arranged for movement serially through three generally orthogonally related quadrants, the frame being equipped with lock means for maintaining the tablet arm in a stored position, and further serving as a bumper when the chair is completely collapsed and retracted within a storage recess in the bleacher.

BACKGROUND AND SUMMARY OF THE INVENTION

In contrast with the prior art, the inventive chair makes use of a linkage mechanism for the various degrees of movement, rather than just one arm that swings in an arc; the tablet arm is arranged to be tightly held against the front leg of the chair when the chair is folded, and this condition does not touch the surface of the bleacher platform or pedestal, retracting into the next bleacher with the chair, making the unit advantageously compact and rugged.

DETAILED DESCRIPTION

FIG. 1 is a top view of a two chair unit with the right tablet arm (right relative to an occupant) folded in the stored position and with the left tablet arm in the position to be used by the occupant;

FIG. 2 is a front perspective view of the two chair unit with the right tablet arm in the stored position, while the left tablet arm is turned, ready to be raised; the right seat being raised to be out of the line of vision;

FIG. 3 is a similar front perspective view with the right tablet arm up and the left tablet arm in the position to be used by the occupant, a portion of the near tablet arm being cut away to give a full view of the further one;

FIG. 4 is a fragmentary side view of the front leg of the chair with the tablet arm in the folded position showing the linkage;

FIG. 5 is a perspective view of the two chair unit in the raised folded position used when sweeping is to be done, shown here to point out the five points of contact with the platform when the chairs are down;

FIG. 6 is a fragmentary side view of the right front leg of the chair with the tablet arm in the position for use;

FIG. 7 is a perspective view of the two chair unit folded down on the platform ready for storage;

FIG. 8 is an exploded view of the parts of the tablet arm assembly; and

FIG. 9 is a fragmentary side view of a retracted bleacher section with a chair unit folded inside of it.

The numeral **10** designates a chair unit useful as a foldaway stadium chair, with the unit equipped with a plurality of backs **11** and the same number of seats **12**. Usually, the unit will be made up of one, two, or three backs and seats. Normally the seats **12** are about one inch narrower than the backs **11**, and a block **13** is provided to connect the seat to the left front leg **14**, allowing space for a folding tablet arm mechanism **15** to be folded and raised between the seat and the leg.

The tablet arm T assumes the following positions in its travel: the stored position **16**, a turned out position **17**, a raised position **18**, and finally a position **19** of operation or use wherein the same is folded over an arm rest **20** for use by the occupant. These four positions are seen in FIGS. 2 and 3.

The folding tablet arm mechanism **15** employs the use of two links, a short link **21** and a longer link **22**. Reference to FIG. 8 reveals that the shorter link **21** (as seen in the central left hand portion of FIG. 8) is equipped with an offset, this being employed to clear a bolt head in the particular environment illustrated. Each link is pivotally coupled to the frame at the corresponding lower end thereof as by clamp plates **23** and **24**. In the exploded view illustrated in FIG. 8, these plates are found immediately to the right of the shorter link **21**. The longer link **22** is also seen closely related to the clamp plates **23** and **24**, and the assemblage is also readily perceived by a consideration of FIG. 6. In FIG. 6, however, the plate **24** is masked by the plate **23**. The plates **23** and **24** are identical except that the plate **24** has one square hole, the plates **23** and **24** being attached to the side of the right front leg **25** (see, for example, FIG. 3).

The upper ends of the links (when the tablet arm T is in the operational position seen in FIG. 6) are pivotally connected to one leaf **26** of a hinge member **27**. As can be appreciated from FIG. 8, the leaf **26** is narrow. The links **21** and **22**, in company with the leaf **26** and clamp plates **23** and **24**, provide essentially a parallelogram-type linkage, operating on the principle of parallel bars to swing the tablet arm from a vertical stored position **16** to a horizontal position of use **19**, as best seen in FIGS. 4 and 6.

When the tablet arm T is swung out from the position **16** to the position **17** (see FIG. 2), it forces the hook arm **29** of a fork-type locking mechanism **28** down into the unlocked position as is seen best in FIGS. 3 and 6. However, when the tablet arm is folded again and swung from the turned out position **17** to the stored position **16**, it strikes the upwardly pointing arm **30** of the fork mechanism **28**, forcing the hook arm **29** up into the locked position. There, the mechanism **28** holds the tablet arm T tightly against the leg **25** as in FIGS. 2 and 4.

When the tablet arm T is locked behind the locking mechanism **28** (as in the case of the showing at **16** in FIG. 2), the chair may be folded and lowered into the prone position as in FIGS. 7 and 9. At that time, the chair rests upon five points of contact with the platform or pedestal of the bleachers. These points (best seen in FIGS. 5 and 9) include a plurality of small rubber bumpers **31** and **32**. The rubber bumpers **31** are smaller and are positioned near the front edge of the seat, while the two large bumpers **32** are located beyond the center of the seat. The fifth point of contact is provided by the hooked surface **29** of the locking mechanism **28**.

Reference is now made to the exploded view in FIG. 8 where it is seen that the tablet arm assembly consists of a plurality of parts besides the rubber bumpers **31** and **32** which are illustrated therein.

The tablet arm T is attached to the hinge **27** by several screws **33** extending through holes in the wide leaf **34** of the hinge **27**. The barrel **35** of the hinge fits into a notch **36** provided in the edge of the tablet arm. The barrel **35** is equipped with a small stop block **37** (see FIG. 8) which prevents the hinge from opening too far when the tablet arm T is in the turned out position **17** or the raised position **18**. Two plastic spacers **38** fit into holes in the wide leaf **34** and protect the arm rest **20** from being scratched by the hinge. A notch **39** is cut into the narrow leaf **26** of the hinge **27** to provide clearance for the tablet arm mechanism when it swings into the down po-

sitions as designated by the numerals **16** and **17**. In the illustration given, this is advantageous, since otherwise the leaf **26** would strike the chair linkage **40** on the right, as seen in FIGS. 2, 7 and 9.

The short link **21** is attached to the narrow leaf **26** by means of a shoulder rivet **42** extending through the hole **41** in the leaf **26**. A corresponding hole **21***a* is provided in the short link **21**. The longer link **22** is attached to the narrow leaf **26** by being mounted at its upper end on a shaft **43** (as seen in FIG. 8). A snap fastener **44** is provided to releasably lock this assembly, and the shaft **43** is attached to the leaf **26** via the hole **45** as by welding or riveting.

The lower end of the short link **21** is mounted on a friction pivot **46** which has a Belleville friction washer, a slightly spherical spring washer **47** mounted on its shoulder **48**. A spacer washer **49** is placed on the shaft of the pivot **46**, and pivot **46** is threaded through the top hole **50** of the right hand clamp plate **23**. The pivot is also inserted through the right front leg **25** so that the square end **51** of the pivot **46** protrudes just enough to slip into the square hole **52** of the left hand clamp plate **24**. A Sems screw **53** (a screw with an external tooth lock washer permanently mounted on it) with a flat washer is threaded into the end of the friction pivot **46**. During initial assembly, this is a loose threading, the tightening occurring later. A hex head bolt **55** is threaded through the lower rear hole **56** of the two clamp plates and the front leg. The bolt **55** has a hex nut **57** threaded on it—also not tightened. Lastly, the projections **58** on the lower link **22** can be snapped into the remaining holes **59** of the two clamp plates **23** and **24**. Once this is done, the screw **53** and nut **57** are tightened securely together.

The locking mechanism **28** is attached to the front leg **25** by inserting the threaded portion **60** through the lower hole of the right front leg **25** from the occupant's left, so that the arm **30** of the fork mechanism points upward. A Belleville friction washer **61** is used to keep the locking mechanism from turning freely, and a hex nut **62** is added.

The rubber bumpers **31** and **33** are mounted on the bottom of each seat **12** in the places indicated as in FIG. 5, with suitable thread cutting screws **63** and **64** and washers **65**.

I claim:

1. In combination, a support structure, a folding tablet arm chair comprising a frame equipped with a generally vertically-extending back when the frame is oriented to support a person, said frame being coupled along the rear side to said support for pivotal collapse, a seat mounted on said frame for movement between generally horizontal and vertical positions, a tablet arm operably associated with said frame, and linkage pivot means interconnecting said frame and tablet arm for moving said tablet arm serially through three generally orthogonally related quadrants and with the tablet underlying said seat when the frame is collapsed.

2. The chair of claim **1** in which said seat is equipped with bumper means to partially support said chair when said frame is collapsed.

3. The chair of claim **2** in which said frame is equipped with lock means for said tablet arm when the latter is in stored position, said lock means being arranged and constructed to provide additional bumper means to support said chair.

4. The chair of claim **1** in which said linkage pivot means includes a generally parallelogram type linkage, said parallelogram type linkage having first and second links pivotally coupled to said frame at corresponding ends thereof and with the other ends operatively associated with said tablet arm, and a hinge member interposed between said other link ends and said tablet arm to provide two of the three quadrant movements.

5. The chair of claim **4** in which said hinge member includes two leaves, one of said leaves being secured to said tablet arm and the other of said leaves being pivotally coupled to said link other ends, one of said links being longer than the other and coupled to said other leaf a spaced distance forwardly of the coupling thereto of the other link, said hinge being equipped with means limiting the pivotal opening movement thereof.

6. The chair of claim **1** in which said frame is equipped with a fork lock mechanism pivotally secured to said frame adjacent the lower end thereof, said tablet arm being operative to be confined between the prongs of said fork mechanism.

7. The chair of claim **1** in which said chair is equipped with an arm rest extending in partial supporting relation to said tablet arm when the latter is in operational position, and bumper means on said tablet arm to prevent the latter from scratching said arm rest.

8. The chair of claim **1** in which said frame is equipped with pivotally mounted fork means to selectively lock said tablet arm in stored position.

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BOBBY R. GAY, Primary Examiner

J. C. MITCHELL, Assistant Examiner

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