

明細書

収納式椅子

5 技術分野

本発明は、移動観覧席等に好適に使用される収納式椅子に関する。

背景技術

- 10 近時、多目的ホール等に設置するための移動観覧席が種々開発されている。この種の移動観覧席は、例えば、高さの異なる段床の左右両端部を移動可能な走行フレームにより支持しておき、その走行フレームの進退動作によって、各段床を雛段状に展開して各段床上に設置した
- 15 椅子を使用可能な状態にしたり、各段床を相互に重合する収納位置まで退避させてコンパクトに収納するようにしたものである。

- そのため、この種の移動観覧席の段床上に設置される椅子は、段床収納時に床面上に平伏するように傾倒させることができるようになっている。具体的には、従来の
- 20 椅子は、例えば、支持部材に枢着された支柱上にビームを架設し、そのビーム上に複数のアームを所定のピッチで立設し、これら各アーム間に座及び背もたれを配設するとともに、各アームの上端に肘部材を枢着している。
- 25 そして、収納する際には、前記支柱及びビームを支持部

2

材に対して前方に回動させることによってその上に支持されているアーム、座、背もたれ、及び、肘部材を床面上に重合状態で平伏させることができるようになっている。

- 5 ところで、この種の椅子は、床面上に平伏させた状態で可及的に重合厚さを小さくする必要がある。そのため、前述した構成のものでは、前記支柱やアームを奥行寸法の小さいスリムなものにせざるを得ない。したがって、専用の劇場椅子等のように重厚な雰囲気をも有する椅子が
- 10 要求される場合には、十分に対応することができないという問題がある。

- また、このように支柱、ビーム、および、アームが単に回動するだけのものでは、その上端に枢着された肘部材を短寸なものにしておかないと、適切な寸法の段床上
- 15 に収まらず、平伏時に段床の前縁から前方にはみ出してしまうことになる。そのため、使用に際し肘部材を十分に機能させることができないばかりか、外観的にも重厚さを欠く一因となっている。

- このような問題は、段床式の移動観覧席に限らず、舞
- 20 台の下などに収納可能な平床式の移動観覧席に使用される椅子等にも同様に存在するものである。

- また、床面上の使用位置と床面下の収納位置との間で昇降可能な昇降部材の上に椅子を配設しておき、椅子を使用しない時には、前記昇降部材を収納位置にまで降下
- 25 させてその椅子を床面下に収納しておくことができるよ

3

うにしたものも開発されているが、この種の観覧席においても、床面に形成する椅子収納用の開口部を可及的に小さくする要請から、椅子を重厚なものにするのが難しいという問題がある。

- 5 本発明は、このような不具合をことごとく解消することができる収納式椅子を提供することを目的としている。

発明の開示

- 本発明は、かかる目的を達成するために、次のような
10 手段を講じたものである。すなわち、本発明に係る収納式椅子は、支持部材と、この支持部材に対して前後方向に回動可能な第1リンク要素と、第1リンク要素の後方に略平行に配設され前記支持部材に対して前後方向に回動可能な第2リンク要素と、第1リンク要素及び第2リ
15 ンク要素の上端部にそれぞれ枢着された肘部材と、第1リンク要素に枢支された座と、第2リンク要素に支承された背もたれとを具備してなることを特徴とする。

- 段床式、あるいは、平床式の移動観覧席に適用する場合
合には、支持部材を段床、あるいは、平床上に設けてお
20 き、第1、第2リンク要素を、床上に起立する使用位置と、床上に平伏する折畳位置との間で回動し得るように構成しておくのがよい。

- 昇降収納式の観覧席に適用する場合には、支持部材を、
床面上の使用位置と床面下の収納位置との間で昇降可能
25 な昇降部材上に設けておき、第1のリンク要素の下端枢

4

支点と第2のリンク要素の下端枢支点との相対高さ位置を変更し得るように構成しておけばよい。

第1、第2リンク要素によって、前後に伸縮可能な脚体の全部を構成してもよいが、第1、第2リンク要素は
5 細身なものにしておき、そのリンク要素間に中間部材を設けて奥行きのある重厚な脚体を構成してもよい。

このような構成のものであれば、第1のリンク要素と、第2のリンク要素とが肘部材により連結されて等長、あるいは、不等長のデュアルリンク機構を構成することになり、この第1、第2のリンク要素により構成される脚
10 体は、その前後幅が変化することになる。すなわち、第1、第2のリンク要素を使用位置から前方に回動させると、両リンク要素が接近しながら床面に向かって移動することになり、最終的に最も接近した状態で床面上に平
15 伏させることが可能となる。そのため、使用位置においては、脚体の前後幅寸法を大きく確保することができ、折畳位置においては、その重合厚さを小さくすることが可能となる。

椅子を昇降部材上に配設している場合には、第1リンク要素の下端枢着点を上昇させるか、第2リンクメンバ
20 の下端枢着点を降下させるか、あるいは、その両方の動作を行わせることによって、肘部材が起立方向に回動するとともに、第1リンク要素と第2リンク要素とが接近し、椅子全体の前後幅寸法が小さくなる。そのため、こ
25 の状態で昇降部材を降下させて該椅子を床下に収納する

5

ようにしておけば、床面に設ける開口部を小さくすることが可能となる。すなわち、使用時には前後幅の大きな脚体を備えているにも拘らず、収納用の開口部を不当に大きくする必要がなくなる。

- 5 以上詳述したように、本発明は、デュアルリンク機構を構成する第1、第2のリンク要素によって脚体を構成しているのので、収納時のコンパクトさを損ねることなしに、使用時における脚体の奥行寸法を大きなものにすることができ、外観的な重厚さや安定性を大幅に向上させて高級感を与えることができる収納式椅子を提供することが
- 10 できるものである。

図面の簡単な説明

- 第1図は、本発明の一実施例を示す概略側面図、第2
- 15 図は、同実施例における収納状態を示す概略側面図、第3図は、同実施例の椅子を拡大して示す側断面図、第4図は、同椅子の折畳状態を示す側断面図、第5図は、同実施例の作用説明図、第6図は、第3図におけるA-A線に沿う端面図である。第7図は、本発明の他の実施例
- 20 を示す概略側断面図、第8図は、同実施例の作用説明図、第9図は、本発明のさらに他の実施例を示す第6図相当の端面図である。

発明を実施するための最良の形態

- 25 以下、本発明の一実施例を、第1図～第6図を参照し

6

て説明する。

この実施例は、本発明を段床式の移動観覧席に適用した場合のものである。この移動観覧席 1 は、複数の段床 2 を具備し、それら段床 2 を、離段状に展開される使用位置（第 1 図参照）と相互に重合する収納位置（第 2 図参照）との間で伸縮動作させ得るように構成したもので、各段床 2 を支持する走行フレーム 3 の構造や、これら各走行フレーム 3 を進退させる駆動機構 4 等は従来のもと同様であるため説明を省略する。

10 段床 2 は、前半部分に床板 5 を有し、後半部分にユニットフレーム 6 を備えている。そして、このユニットフレーム 6 上に、本発明に係る椅子 7 を配設している。

椅子 7 は、前記ユニットフレーム 6 上に取着した支持部材 8 と、この支持部材 8 に対して前後方向に回動可能な第 1 リンク要素 9 と、第 1 リンク要素 9 の後方に略平行に配設され前記支持部材 8 に対して前後方向に回動可能な第 2 リンク要素 11 と、第 1 リンク要素 9 及び第 2 リンク要素 11 の上端部にそれぞれ枢着された肘部材 12 と、第 1 リンク要素 9 に枢支された座 13 と、第 2 リンク要素 11 に支承された背もたれ 14 とを具備してなる。

詳述すれば、第 1 リンク要素 9 は、第 6 図に示すように、後方に開口した平断面偏平コ字形のもので、下端部を支軸 9a を介して支持部材 8 に前後方向に回動可能に枢着している。第 2 リンク要素 11 は、後縁にリブ 11

7

cを有する平板状のもので、その前縁側を前記第1リンク要素9内に摺動可能に嵌入させており、この第1、第2リンク要素9, 11によって椅子7の脚体15を構成している。第2リンク要素11の下端部は、支軸11aを介して前記支持部材8に枢着してある。

肘部材12は、下方及び後方に開口した中空体状のもので、前記第1、第2リンク要素9, 11の上端部に帽嵌させてある。そして、この肘部材12の中間部を第1リンク要素9の上端部に軸9bを介して枢着するとともに、後端部を第2リンク要素11の上端部に軸11bを介して枢着している。

座13は、対をなす脚体15間にライジング可能に配設されたもので、その基端部を軸13aを介して第1リンク要素9の側面に設けた軸受部9cに枢支させている。なお、この座13の枢支部分は、従来のライジング式の座と同様な構成をなしているため、詳細な説明は省略する。しかして、この座13は、第3図の実線に示すライジング位置まで自動的に回動し得るように図示しないスプリングにより付勢されており、上面に荷重をかけることにより第3図の想像線で示す着座位置まで回動するようになっている。そして、この座13を下面側から押圧すると、該座13はライジング位置から、さらに、背もたれ14に重合する位置まで回動し得るようになっている。

背もたれ14は、対をなす脚体15間に配設されたも

8

ので、左右の第2リンク要素11に固定されている。

次いで、この実施例の作動を説明する。

まず、第1図及び第3図に示すように、段床2が雛段状に展開されている使用位置においては、第1、第2リンク要素9、11が相互に平行な姿勢で起立しており、これら第1、第2リンク要素9、11により構成される脚体15は、前後幅が大きい状態に維持されて重厚さを演出することになる。

段床2を収納する場合には、まず、各椅子7の第1、第2リンク要素9、11を前方に回動させる。その際、両リンク要素9、11は、平行状態を保ちつつ回動し、床面5a上に平伏した段階においては、第2リンク要素11が第1リンク要素9内に深く侵入して脚体15は幅の狭いものとなる。そのため、使用時には前後幅が大きく重厚な感じを与え得る脚体15が、収納する際には比較的薄く折り畳まれることになる。すなわち、平伏状態では、第2図及び第4図に示すように、座13が背もたれ14に重合するとともに脚体15の幅が縮小して、全体の重合厚さが小さなものとなる。この状態で、各段床2を第2図に示すように相互に重合する収納位置にまで後退させることによって、平伏した各椅子7が次段の段床2の下に潜り込むことになる。肘部材12は、第1、第2リンク要素9、11と共働して不等長のデュアルリンク構造を構成しており、平伏状態においては、第4図及び第5図に示されるように、各リンク要素9、11と略

平行な位置にまで折畳まれることになる。

なお、本発明は、以上説明した実施例のものに限定されるものではなく、例えば、舞台の下に形成された空間内に収納することができる可動平床上に複数の椅子を起
5 倒可能に設置してなる平床式の移動観覧席等にも同様に適用が可能である。また、第7図及び第8図に概略的に示すような床下収納式の観覧席等にも適用することができる。この床下収納式の観覧席21は、床22に開口部23を設けておき、この開口部23に昇降部材24を配
10 設するとともに、この昇降部材24上に本発明に係る椅子7を設置したものである。昇降部材24は、図示しない昇降機構によりその上面24aが床面22aと略面一となる使用位置（第7図参照）と、開口部23内に没入する収納位置（第8図参照）との間で、昇降し得るよう
15 に構成されている。椅子7は、前述した実施例と略同様な構成をなすもので、同一或いは相当する部分には、同一の符号を付して説明を省略する。この椅子7が前記実施例のものと異なっている点は、第2リンク要素11の下端枢支点11kを構成する軸11aを、軸昇降機構2
20 5を介して支持部材8に支承させている点にある。この軸昇降機構25は、例えば、軸11bを昇降ブラケット26により枢支するとともに、その昇降ブラケット26を、本体27内に配設した図示しないねじ送り機構やリンク機構、あるいは、油圧シリンダなどにより昇降させ
25 得るように構成したものである。

10

このような構成のものであれば、第7図に示す使用状態から、軸昇降機構25を作動させて第2リンク要素11の下端枢支点11kを第1リンク要素9の下端枢支点9kに対して降下させると、肘部材12がその前端を上昇させる方向に回動するとともに、第2リンク要素11が第1リンク要素9に接近しつつ侵入し、脚体15の奥行寸法が小さくなる。この状態で、昇降部材24を降下させると、椅子7全体が床下に収納されることになり、昇降部材24が収納位置に到達した段階で、開口部23の蓋23aを閉める。なお、背もたれ14と座13は、例えば、開口部23内に配設した図示しない摺接案内部材や車輪等により案内して適宜重合させればよい。なお、この実施例では、第2リンク要素の下端枢着点を降下させた場合について説明したが、第1リンク要素の下端枢着点を上昇させて椅子を偏平に畳むようにしてもよい。

また、以上説明した実施例では、第1、第2リンク要素のみによって、前後に伸縮可能な脚体を構成している場合について説明したが、例えば、第9図に示すように、第1、第2リンク要素で、脚体の一部を構成するようにしてもよい。すなわち、この脚体15は、第1、第2リンク要素9、11をそれぞれ平面視コ字形をなすものにし、これら両リンク要素9、11に中間板31を摺動可能に係合させたもので、前記第1、第2リンク要素9、11の作動により該脚体15の奥行寸法は変化し得るようになっている。脚体は、このような構成に限らず、さ

1 1

らに、第1、第2リンク要素間にバネクロスや蛇腹部材等を介設したもの等であってもよい。あるいは、第1、第2リンク要素間に空間が形成されているものであってもよい。また、第1、第2リンク要素は、前述のような
5 不等長なものに限らず、等長なものであってもよい。

また、背もたれは、図示実施例のものに限定されるものではなく、例えば、背もたれを、第2リンク要素に対して一定角度だけ回動し得るように支承させておくなど、本発明の趣旨を逸脱しない範囲で種々変形が可能である。

10

産業上の利用可能性

以上のように、本発明に係る収納式椅子は、使用の際には外観的な重厚さが要求され収納する際にはコンパクトさが必要とされる移動観覧席用の椅子等として好適に
15 使用される。

20

25

1 2

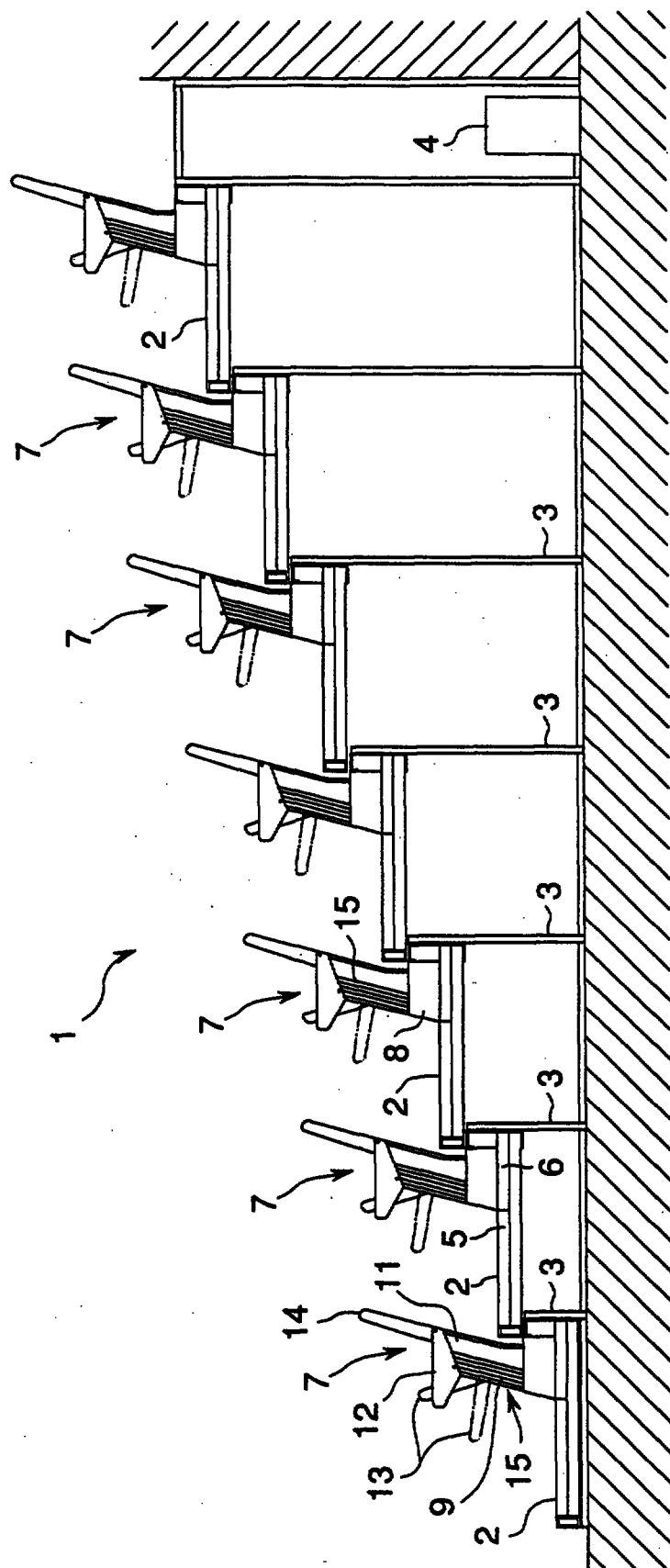
請求の範囲

1. 支持部材と、この支持部材に対して前後方向に回動可能な第1リンク要素と、第1リンク要素の後方に略平行に配設され前記支持部材に対して前後方向に回動可能な第2リンク要素と、第1リンク要素及び第2リンク要素の上端部にそれぞれ枢着された肘部材と、第1リンク要素に枢支された座と、第2リンク要素に支承された背もたれとを具備してなることを特徴とする収納式椅子。
2. 支持部材が、前後方向に進退動作する移動観覧席の床上に設けられたものであり、第1、第2リンク要素が、床上に起立する使用位置と、床上に平伏する折畳位置との間で回動し得るように構成されていることを特徴とする請求の範囲第1項記載の収納式椅子。
3. 支持部材が、床面上の使用位置と床面下の収納位置との間で昇降可能な昇降部材上に設けられたものであり、第1のリンク要素の下端枢支点と第2のリンク要素の下端枢支点との相対高さ位置を変更し得るように構成していることを特徴とする請求の範囲第1項記載の収納式椅子。
4. 第1、第2リンク要素が、前後に伸縮可能な脚体の一部又は全部を構成していることを特徴とする請求の範囲第1項、第2項又は第3項記載の収納式椅子。



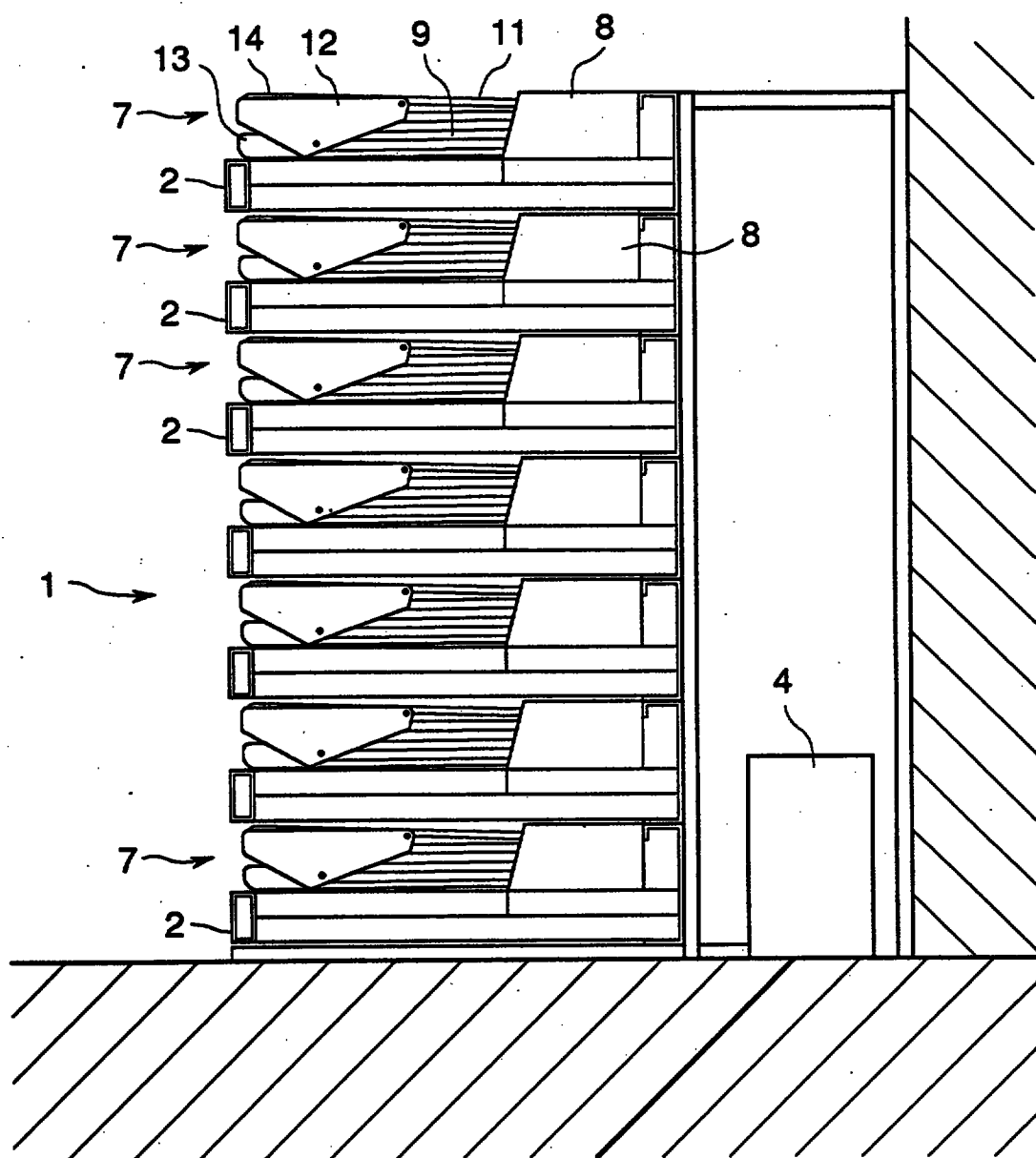
1/9

第 1 図



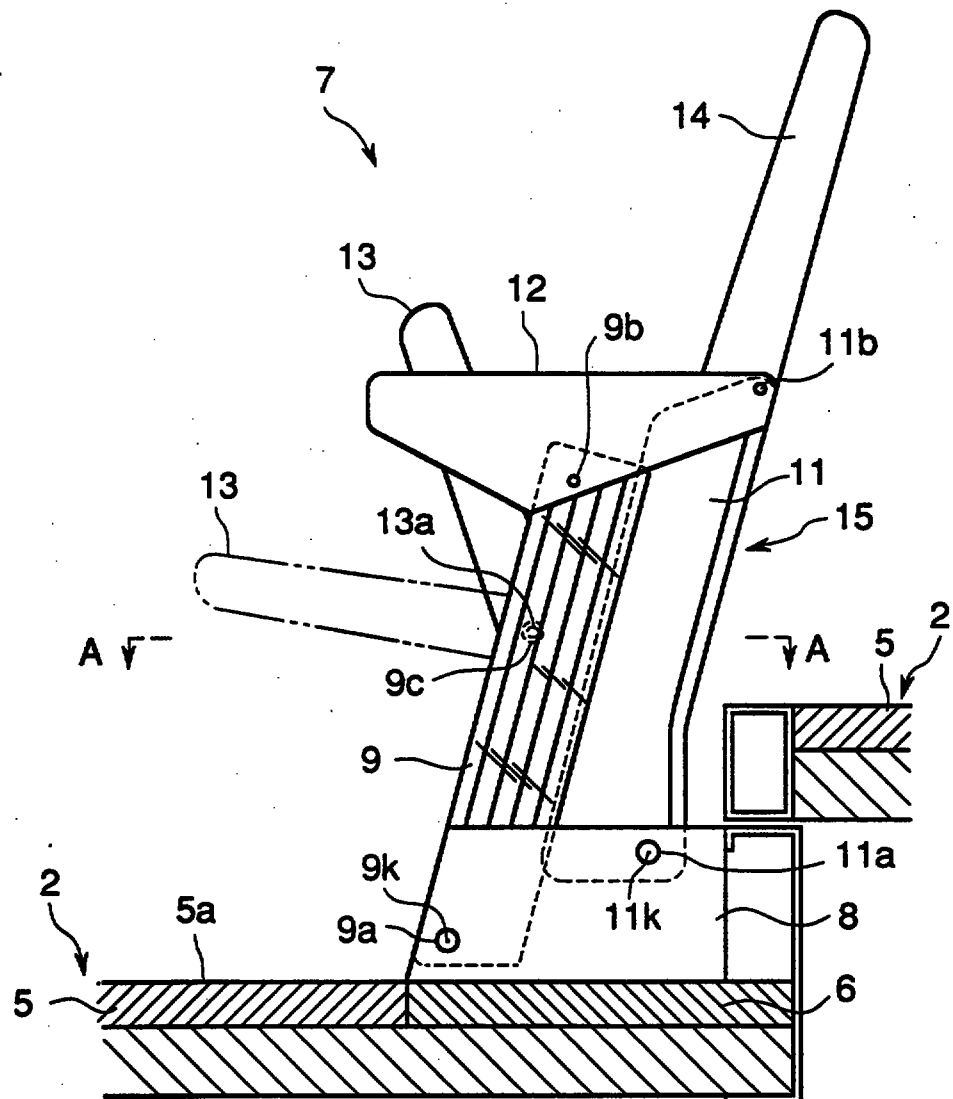
2/9

第 2 図

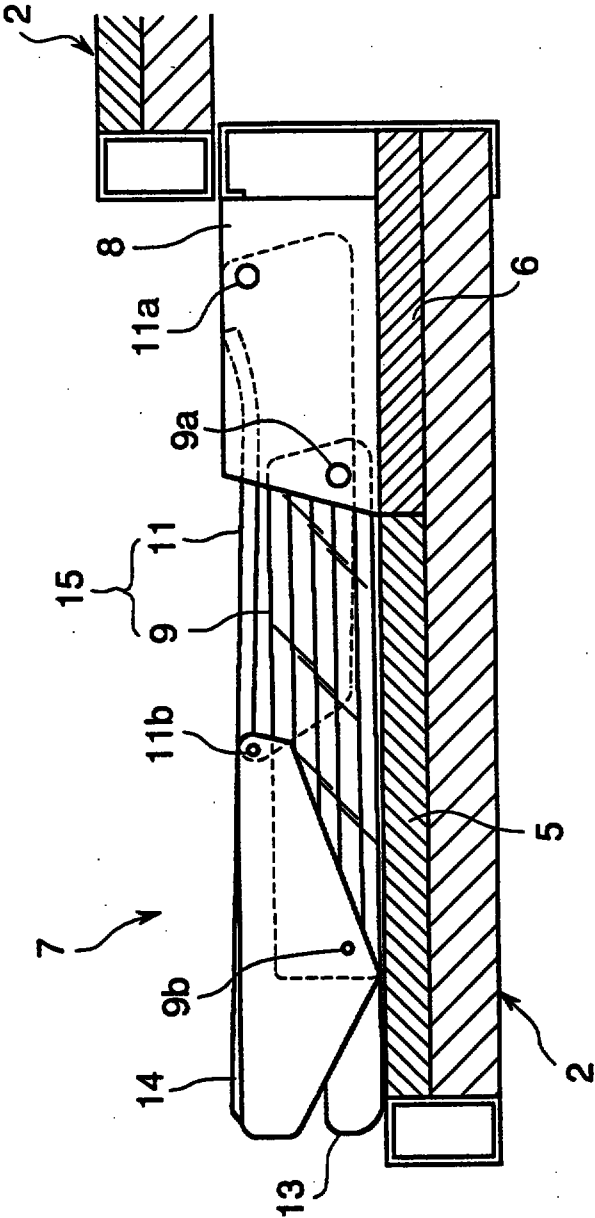


3/9

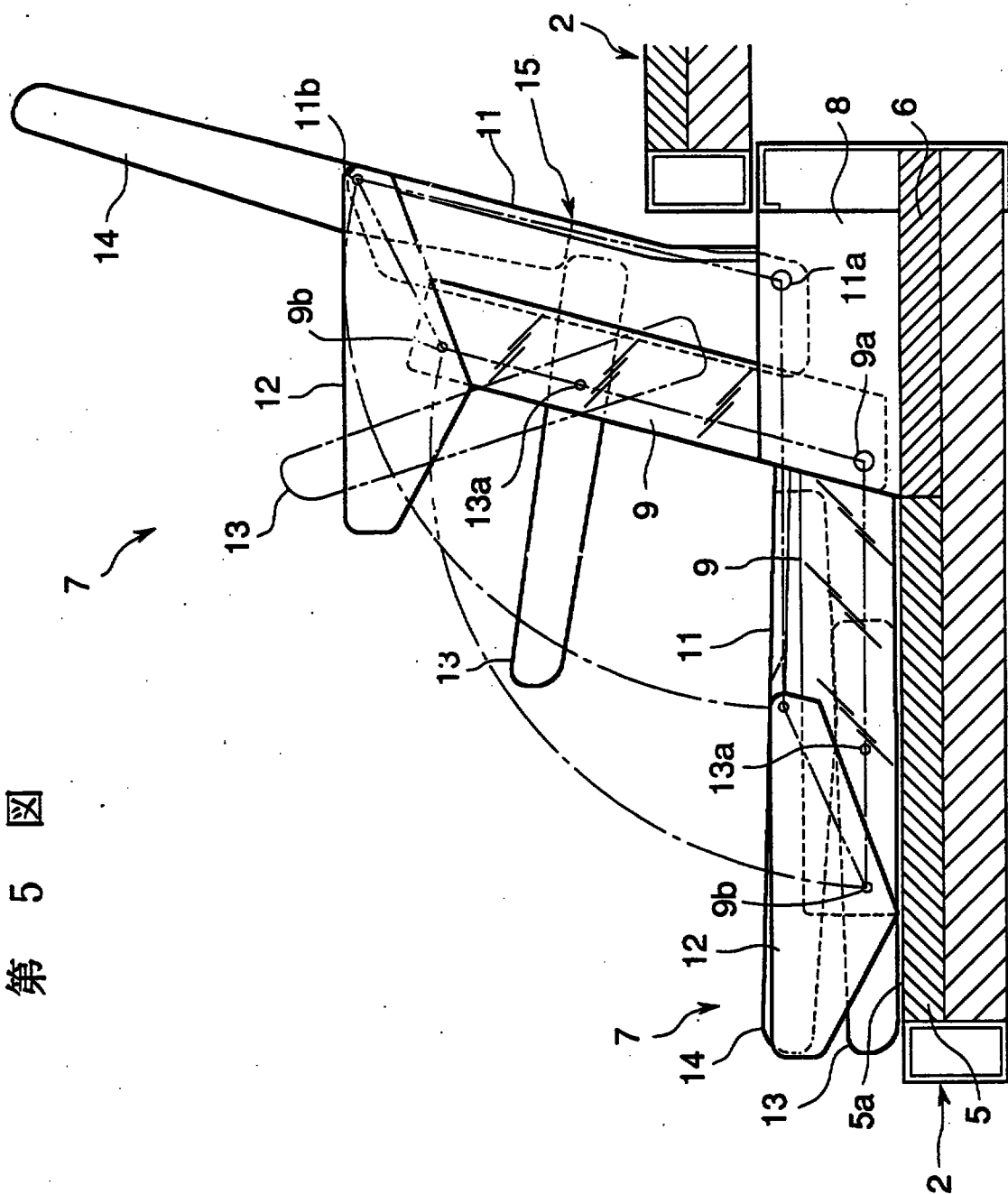
第 3 図



第 4 図

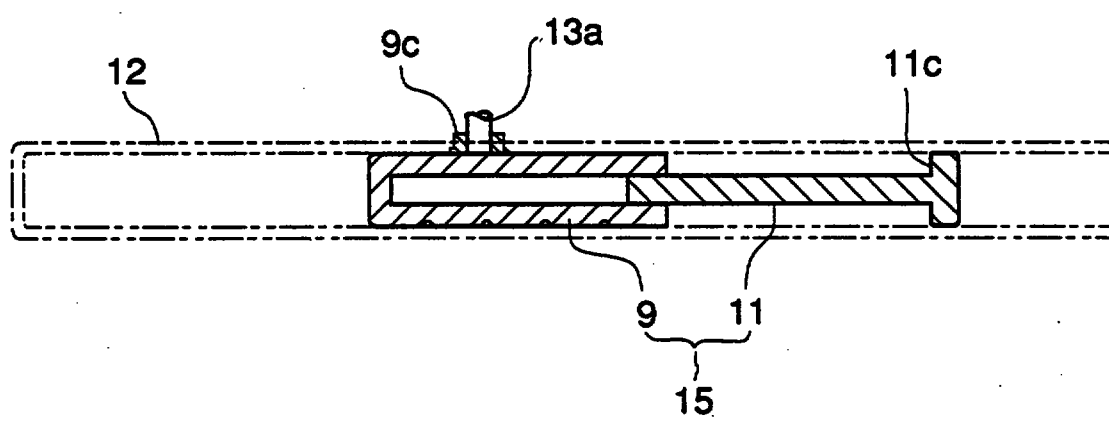


第 5 図



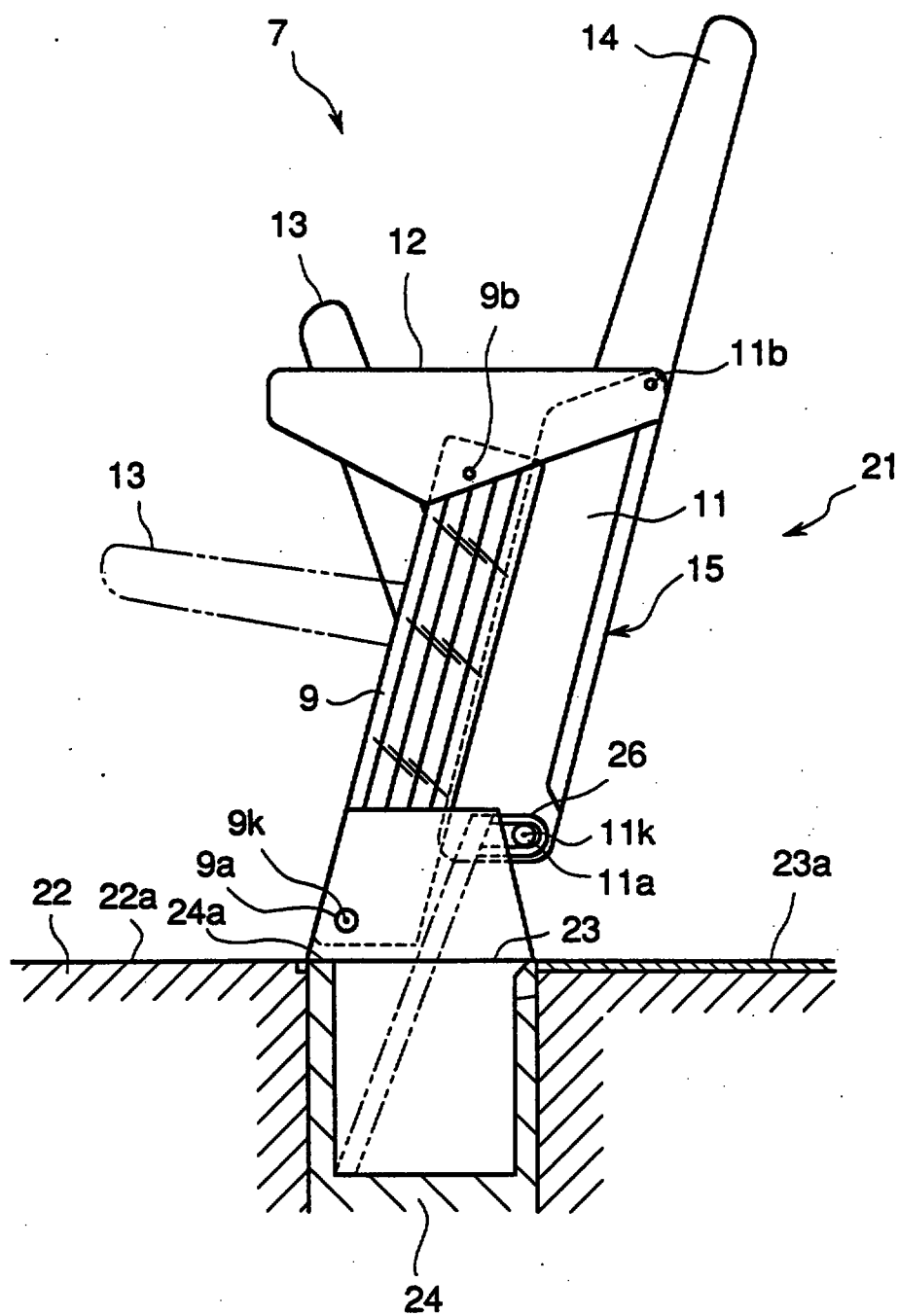
6/9

第 6 図



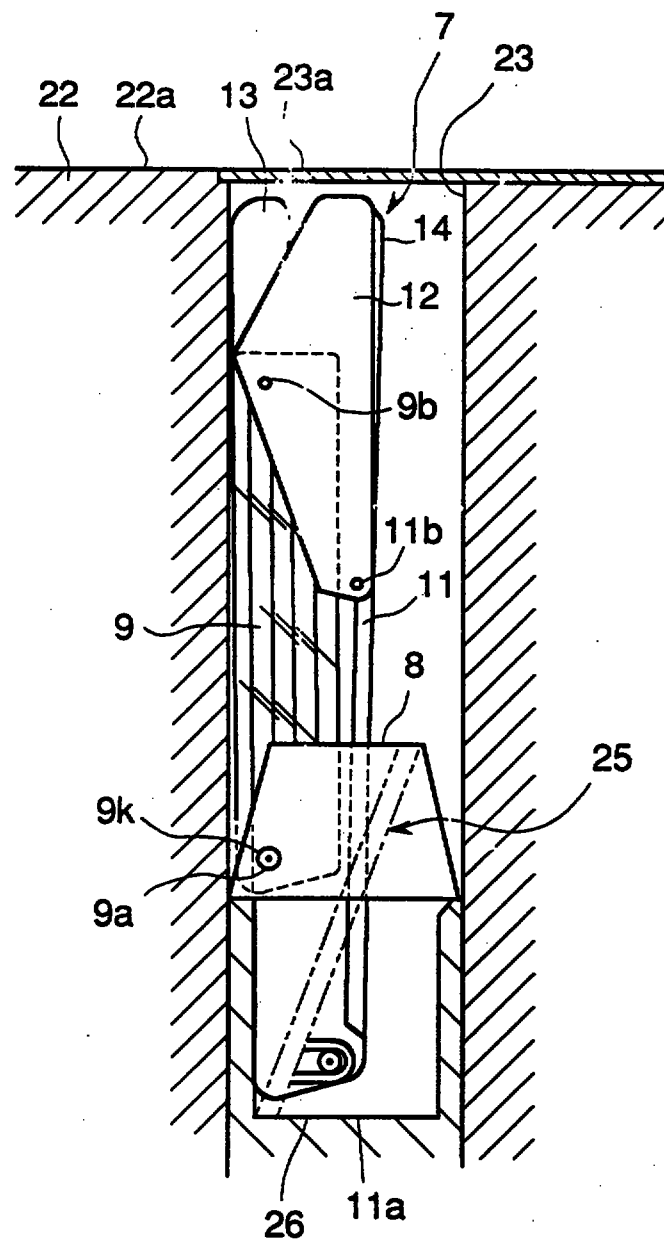
7/9

第 7 図



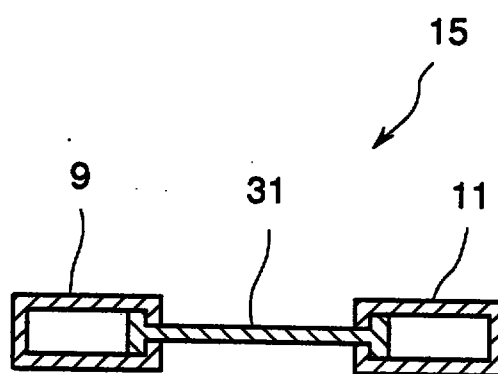
8/9

第 8 図



9/9

第 9 図



SPECIFICATION

FOLDABLE CHAIR

FIELD OF THE ART

5 This invention relates generally to foldable chairs and, more particularly, to a new and improved foldable chair of the type and construction suitable for use on a movable bleacher stand or the like.

BACKGROUND ART

10 Various types of movable bleacher stands have been developed of late for installation in a multi-purpose hall or gymnasium. A typical movable bleacher stand includes a plurality of retractable multi-stepped stand sections, both sides of which are supported by movable frames. When the bleacher stand is not used, the movable support frames are
15 usually kept in their retracted positions, where the plurality of stepped stand sections are held stacked or nested on one another in a relatively small overall configuration, thereby clearing the floor. In order to use the bleacher stand, the movable support frames are advanced
20 to extend the stand sections into a multi-stepped configuration. For this purpose, the chairs to be installed on the stepped floor sections are conventionally of such design that they tilt down and lie flat on the floor surface for storage when not in use. Typically, in the prior-art
25 bleacher stand, a plurality of support blocks are located spaced apart side by side on the support base, and one or more elongated support beams are placed transversely on these blocks. Mounted upright on the support beams in a

REPLACED SHEETS	SG
☒ Description : paged 318, 319 to paged	
☒ Claim(s) : paged ..15... to paged	
☐ Drawing(s) : paged to paged	
☒ Abstract : paged ..17... to paged	
DATE OF RECEIPT	

spaced-apart relationship are a plurality of support legs of the chairs, upon the upper ends of which armrests are mounted. Seats and backrests extend or span between two adjacent support posts. In order to store the chairs, the support blocks together with the support beam are tilted forward, causing the support legs, seats, backrests and armrests to be stacked flat one upon another on the floor.

With this type of collapsible chairs, it is essential to reduce the collapsed configuration of each chair to a minimum for space economy. In order to meet this requirement, it has conventionally been attempted to use thinner support blocks and legs. However, with these chairs, it is difficult to meet the demand, for example, of a theater where chairs weighty and sturdy in appearance are needed.

Moreover, in the conventional arrangement where the support blocks, beams and legs are simply designed to be tilted, it is necessary to employ short armrests. Otherwise, they extend outwardly beyond the front edge of the floor section when the chair is collapsed flat. The short armrests are not sufficiently comfortable to rest our arms on, while, at the same time, they lack a weighty appearance.

These problems are not limited to the prior-art chairs to be installed on the multi-stage, stepped movable bleacher stand, but also are found in those chairs for use on a single-stage, flat movable bleacher stand, which is designed to be retracted under the stage of a hall or gymnasium for storage.

A bleacher stand of a different design has been developed wherein foldable chairs are mounted on a lift mechanism that moves up and down between upper and lower positions. When it is intended to use the chairs, the lift mechanism remains in the upper position to hold the chairs out on the floor, and when not in use, the mechanism is retracted down to the lower position to keep the chairs stored under the floor. However, with this type of bleacher stand, it is impossible to employ chairs weighty in appearance and sturdy in construction since the storage opening made in the floor must be kept at a minimum size.

It is an object of the invention to provide a new and improved foldable chair which is capable of overcoming these and other problems.

15 **DISCLOSURE OF THE INVENTION**

In order to achieve this object, a preferred embodiment of the foldable chair of the present invention comprises a support base, a pair of first link members pivotally movable with respect to the base member, a second pair of link members mounted behind and in parallel to the first link members for pivotal movement with respect to the base member, a pair of armrests pivotally mounted to the upper ends of the first and second link members, a seat pivotally supported by the pair of first link members, and a backrest pivotally supported by the pair of second link members.

When it is intended to install the foldable chair of the invention on a single-stage, flat movable bleacher stand or a multi-stage, stepped movable bleacher stand, the



support base is preferably mounted on the flat floor or floor section, while the first and second pairs of link members are mounted for pivotal movement between an extended position where the chair stands upright on the floor for use, and a folded position where the chair is folded flat on the floor for storage.

When it is contemplated to install the foldable chair of the invention on a bleacher stand of the underfloor storage type, the support base is preferably mounted on a lift mechanism which moves between an upper position where the chair is extended out on the floor for use, and a lower position where the chair is retracted under the floor for storage. The relative vertical positions of the lower pivot point of the first link member and the lower pivot point of the second link member are variable.

The pair of support legs variable in width may be formed solely by the first and second pairs of link members, or alternatively, they may be formed by the first and second pairs of thin link members and an intermediate member that connects the link members together, thereby giving them a weighty and sturdy appearance.

With this arrangement of the foldable chair, the first and second link members are pivotally connected by means of the armrest to form a dual linkage of equal or unequal length, so that the support legs of the chair formed by the first and second pairs of link members are variable in width. As the first and second link members are pivoted forward, both the link members move closer toward the floor

while moving closer to each other until finally they lie flat on the floor in a telescopically nested relationship. Thus the foldable chair of the present invention has support legs of bulky configuration in its extended, for-use position, while in its folded position, the chair assumes a relatively small overall configuration.

In the arrangement of the foldable chair where it is mounted on a lift mechanism, either the upward movement of the lower pivot point of the first link member, or the downward movement of the lower pivot point of the second link member, or the combined movement of both causes the armrest to be displaced upright and the first and second link members to be brought closer together, leading to a compact overall configuration of the folded chair. If it is intended to bring down the chair into a storage space under the floor by means of the lift mechanism after the chair has been folded compactly in this manner, the access opening to the storage space can be made smaller in size. In short, although the foldable chair of the invention has a pair of rather bulky support legs in use, it does not require an excessively large access opening leading to the storage space under the floor.

As explained in brief hereinabove, the fact that the support legs of the foldable chair according to the invention consist of the first and second link members, which together form a dual linkage, is instrumental in achieving a bulky configuration of the support legs when the chair is in use, while, at the same time, bringing about a

comparatively small overall configuration of the chair when folded for storage. Thus, the foldable chair has been provided having a weighty and luxurious appearance as well as much improved stability.

5 **BRIEF DESCRIPTION OF THE DRAWINGS**

FIG. 1 a schematic view in elevation showing a plurality of new and improved chairs according to one preferred embodiment of the invention as installed on a stepped bleacher stand;

10 FIG. 2 is a schematic view in elevation showing the chairs of FIG. 1 stacked on one another in the retracted storage position of the bleacher stand;

FIG. 3 is an enlarged elevational view, partly in section, of one of the chairs shown in FIG. 1;

15 FIG. 4 is an enlarged elevational view similar to FIG. 3, showing the chair in its compactly folded position;

FIG. 5 is an enlarged elevational view similar to FIG. 3, showing the chair extended and folded;

20 FIG. 6 is a horizontal cross-sectional view taken along line A-A in FIG. 3;

FIG. 7 is an enlarged elevational view similar to FIG. 3, showing a new and improved chair according to another preferred embodiment of the invention;

25 FIG. 8 is an enlarged elevational view similar to FIG. 7, showing the compactly folded chair kept in a storage space in the floor;

FIG. 9 is a horizontal cross-sectional view similar to FIG. 6 showing the support leg of a chair according to still

another embodiment of the invention.

BEST MODES OF EMBODYING THE INVENTION

Now referring to FIGS. 1 to 6, one preferred embodiment of the invention will be described in detail.

5 It is noted that, in the illustrated embodiment, the present invention has been applied to a multi-stage, stepped bleacher stand that is movable on the floor or otherwise flat supporting surface. The movable multi-stage, stepped bleacher stand 1 has a plurality of stand sections 2, and is
10 designed to be movable between an extended stepped position for use as shown in FIG.1 and a retracted stacked position for storage as shown in FIG. 2. The support frame 3 for movably supporting each stand section 2, and the drive mechanism 4 for driving the movable support frames 3 between
15 their extended and retracted positions are well-known in the art and, therefore, no detail description thereof is given here.

Each stand section 2 includes a floor panel 5 and a unit frame 6 located in the front and rear half portions,
20 respectively. Disposed on each unit frame 6 is a unique chair 7 of foldable or collapsible construction according to the invention.

As shown, the foldable chair 7 comprises a supporting base 8 fixedly attached to the unit frame 6, a pair of legs
25 each comprising a first link member 9 pivotally mounted for forward and rearward swing motion with respect to the support base 8 and a second link member 11 mounted behind the first link 9 generally in parallel thereto for forward

and rearward pivotal movement with respect to the support base 8, an armrest 12 pivotally connected to the upper ends of the first and second link members 9 and 11, a seat 13 pivotally supported by the first link member 9, and a
5 backrest 14 supported by the second link member 11.

More specifically, the first link member 9 is in the form of a flat rectangular hollow post with one narrower side removed for the purpose hereinbelow explained, giving it a U-shaped horizontal cross section as shown in FIG. 6.
10 The first link member 9 has its lower end pivotally connected to the support base 8 by means of an axle or shaft 9a for to- and-fro swing motion between its generally upright position for use and its horizontal position for stacked storage (see FIG. 5). The second link member 11 is
15 in the form of a flat plate having a longitudinal rib 11c integrally made along its rear edge, and has its front edge slidably inserted within the first link member 9 through its open side. Thus, the first and second link members 9 and 11 together form a support leg 15 of the foldable chair. As in
20 the case of the first link member 9, the second link member 11 also has its lower end pivotally connected to the support base 8 by means of an axle 11a.

The armrest 12 comprises a hollow box-like member with its lower and rear sidewalls removed. The armrest 12 is
25 snugly fitted over the upper ends of the first and second link members 9 and 11. It is also pivotally mounted at its middle portion to the upper end of the first link member 9 by means of an axle 9b, and at its rear portion to the upper



end of the second link member 11 by means of an axle 11b.

5 The seat 13 is provided between a pair of support legs 15 and has its rear portion pivotally mounted to the first link member 9 by means of an axle 13a, which snugly fits into a bearing support 9c provided at the inner face of the first link member 9. The arrangement for pivotally mounting the seat 13 is essentially similar to those of the prior-art and, therefore, no further description is given here. Suitable spring means (not shown) is employed to normally
10 force the seat 13 upwardly into a generally upright unseating position as shown in FIG. 3. When pushed or pulled down, the seat 13 pivots down toward its horizontal seating position as shown in imaginary lines in FIG. 3. It should be noted that the seat 13 in its upright unseating position can
15 be pivoted further back into a fully folded position by pushing it backward, where the seat 13 is nested onto the backrest 14.

The backrest 14 also extends between the pair of supporting legs 15 and is fixedly mounted to the pair of
20 second link members 11.

The manipulation of the above described chair mechanism is now explained with reference to the drawings.

FIGS. 1 and 3 shows the multi-stage bleacher stand 1 in its fully extended state for use, with the first and second
25 link members 9 and 11 standing generally upright in parallel to each other. In this positional condition, the support leg 15 formed by the first and second link members takes on an extended front-to-rear configuration, which in turn gives

individual chairs a weighty and sturdy appearance.

In order to retract the stand sections 2 of the multi-stage bleacher stand into the storage position, the first and second link members 9 and 11 of each chair 7 are pivoted forward down onto the floor panel 5. During this forward pivotal movement, the first and second link members move together keeping their parallel relationship with respect to each other, and when they lie flat on the floor surface 5a, the second link member 11 is fitted deep within the first link member 9 in a telescoping manner so that the support leg 15 as a whole is collapsed into a compact size. It should be noted that the support leg 15, which assumes the weighty and sturdy configuration in use, can be folded into a relatively small overall configuration for storage. As clearly shown in FIGS. 2 and 4, in the lying-flat or folded position of the chairs 7, the backrest 14 is nested onto the seat 13, while the support leg 15 is reduced in lateral size, leading to a minimum possible configuration of the whole chair. With this configuration of the chairs 7, each of the movable stage sections 2 is retracted into the stacked storage position as shown in FIG. 2, where one folded chair 7 lies subjacent to another chair 7 in a nested relationship. The armrest 12, which forms together with the first and second link members 9 and 11 a differential dual linkage, lies flush with each link member in the folded position of the chair as best shown in FIGS. 4 and 5.

The present invention is not limited to the above described embodiment but may be applied with equal utility

to a single stage movable bleacher stand where a plurality of foldable chairs are installed on a movable flat floor structure which can be retracted into a storage space provided under the stage of a hall or gymnasium.

5 Alternatively, this invention is advantageously applicable to a bleacher stand where the chairs are to be retracted down into a storage space or recess provided in the floor as schematically illustrated in FIGS. 7 and 8. With this underfloor storage type bleacher stand 21, there is provided

10 a storage recess 23 under the floor 22. The storage recess houses a lift 24 on which the chair 7 of the invention is mounted. A drive mechanism not shown moves the chair lift 24 up and down between an uppermost position (FIG. 7) and a lowermost position (FIG. 8). In the uppermost position, the

15 top face 24a of the lift 24 is essentially flush with the floor surface 22a, and the chair 7 mounted on the lift is held out of the storage recess 23 for the intended use, while in the lowermost position, the lift 24 is fully retracted into the storage recess together with the chair.

20 The chair 7 itself is similar in construction to the one explained in detail hereinabove in connection to the preferred embodiment of the invention and, therefore, like or corresponding parts are designated by like reference numerals. The chair 7 differs from that of the previous

25 embodiment in that an axle 11a which acts as the lower pivot point 11k for the second link member 11 is supported by the support base 8 via an axle drive mechanism 25. The axle drive mechanism 25 includes a lift bracket 26 for supporting

the axle 11a. The bracket 26 is designed to be moved up and down by drive means such as a screw feed mechanism, linkage mechanism or hydraulic cylinder (not shown) to be housed within the body 27.

5 With this arrangement, when the axle drive mechanism 25 is actuated while the chair 7 is in its extended position for use as shown in FIG. 7, the lower pivot 11k of the second link member 11 is brought down with respect to the lower pivot 9k of the first link member 9, causing the
10 armrest 12 to rotate upwardly on the upper axle 11b on one hand, and causing the second link member 11 to be fitted into the first link member 9 in a telescopic relationship on the other. As a result, the support leg 15 formed essentially by the first and second link members collapses
15 into a compact configuration. At this point of manipulation, the chair lift 24 is initiated into its downward movement to bring down the whole chair 7 into the storage recess 23 in the floor. As the chair lift 24 reaches its lowermost storage position, the cover 23a is moved to close the recess
20 23. It should be pointed out that the seat 13 and the backrest 14 may be brought into nesting relationship with one another by suitable means such as a sliding guide mechanism or guide wheels. Also, instead of lowering the lower pivot of the second link member with respect to the
25 first link member, the lower pivot of the first link member may be brought upward with respect to the second link member in order to collapse the chair into a compact configuration.

Although, in the above modified form of the invention,

only the first and second link members constitute the leg collapsible widthwise, an additional component part may be employed as shown in FIG. 9. The support leg 15 of FIG. 9 comprises the first and second link members 9 and 11, both of which have a generally U-shaped horizontal cross-section, and an interconnecting plate 31 engageably fitted into the link members for relative sliding movement. The first and second link members 9 and 11 are interconnected by the plate 31 so that their relative movement may effectively reduce the overall configuration or size of the support leg 15. In lieu of the interconnecting plate 31, resilient cloth or accordion fold means may suitably be used to connect the first and second link members together. Alternatively, a space may be provided between the first and second link members.

Although the link members are explained hereinabove as being of different length, they may have an equal length. As for the backrest, it may suitably be designed to rotate through a limited angle with respect to the second link member.

While several preferred embodiments of the invention have been described in detail hereinabove, such description is for illustrative purposes only, and it is to be understood that changes and modifications may be made without departing from the spirit or scope of the invention.

POSSIBLE APPLICATIONS IN INDUSTRY

From the foregoing description, it is seen that the chair constructed according to the invention is particularly



advantageous for installation on a movable bleacher stand where it is required that the chairs have a weighty and sturdy outer appearance in use and, at the same time, are capable of being reduced into a compact configuration for storage when not in use.

5

10

15

20

25

**CLAIMS:**

1. A foldable chair comprising a support base; a pair of legs each comprising a first link member pivotally movable with respect to the base member and a second link member mounted behind and in parallel to said first link member for pivotal movement with respect to said base member; an armrest pivotally mounted to the upper ends of said first and second link members; a seat pivotally supported at each of its opposite sides by said first link member; and a backrest pivotally supported at each of its opposite sides by said second link member.

2. The foldable chair according to Claim 1, wherein said support base is mounted on the floor of a bleacher stand movable between an extended position for use and a retracted position for storage, and said first and second link members are pivotable between a position where said chair stands upright for use on said floor and a position where said chair is folded lying flat on said floor.

3. The foldable chair according to Claim 1, wherein said support base is mounted on lifting means for moving said chair between a position for use on said floor and a position for storage under said floor, and said first and second link members are designed so that the relative positions of the lower pivot points of said first and second link members can be changed.

4. The foldable chair according to Claims 1, 2, or 3, wherein said first and second link members form a part or the whole of each said variable width support leg of said



chair.

5

10

15

20

25



ABSTRACT

Disclosed is a foldable chair of the type which is capable of being folded or collapsed into a compact configuration when not in use, while at the same time, is
5 capable of giving a weighty and sturdy appearance when in use, for example, on a movable bleacher stand. The chair 7 comprises a support base 8 to be installed on a floor 2, a pair of legs each comprising a first link member 9 pivotally mounted for a to-and-fro swing motion with respect to the
10 support base 8 and a second link member 11 pivotally mounted behind the first link member 9 essentially in parallel therewith for a to-and-fro swing motion with respect to the support base 8, an armrest 12 pivotally connected to the upper ends of the first and second link members, a seat 13
15 pivotally supported at each of its lateral sides by the first link member 9, and a backrest 14 pivotally supported at each of its opposite lateral sides by the second link member 11.

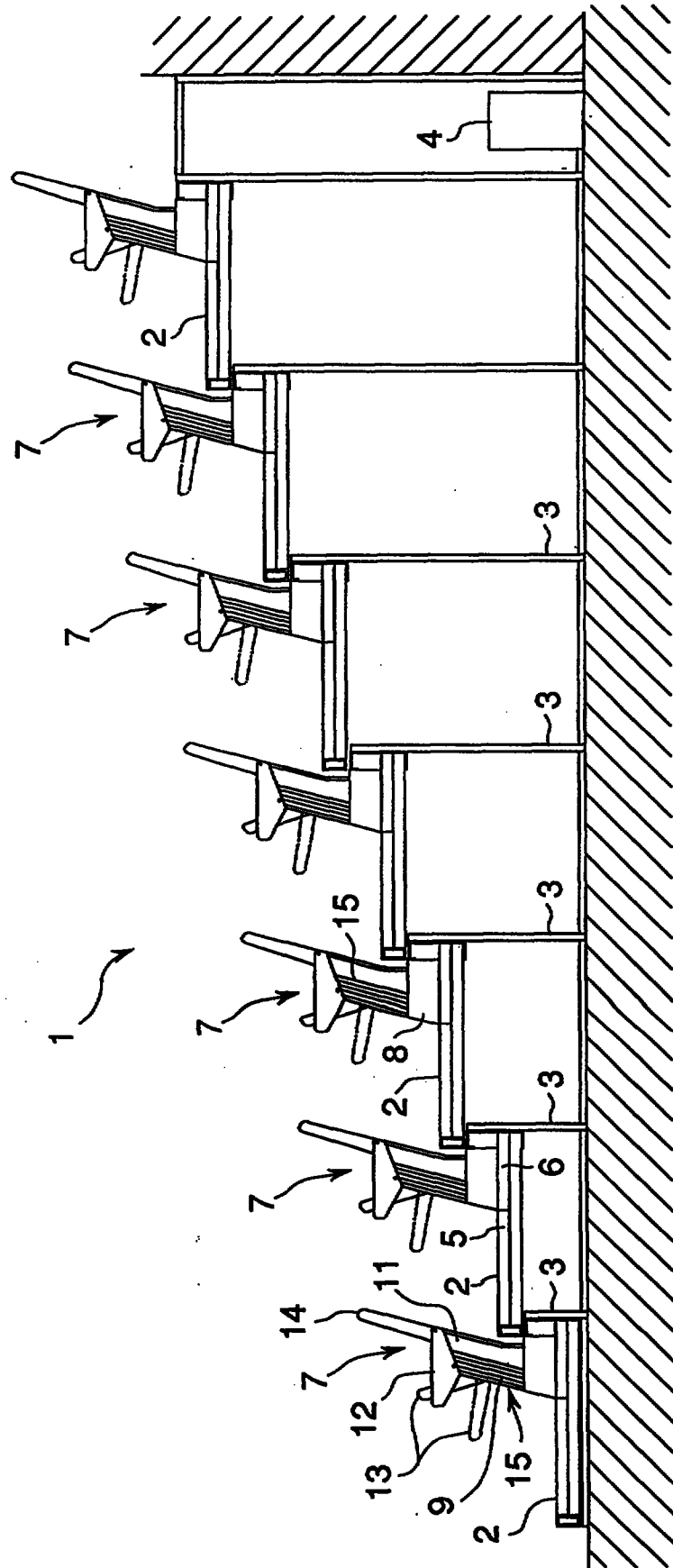
20

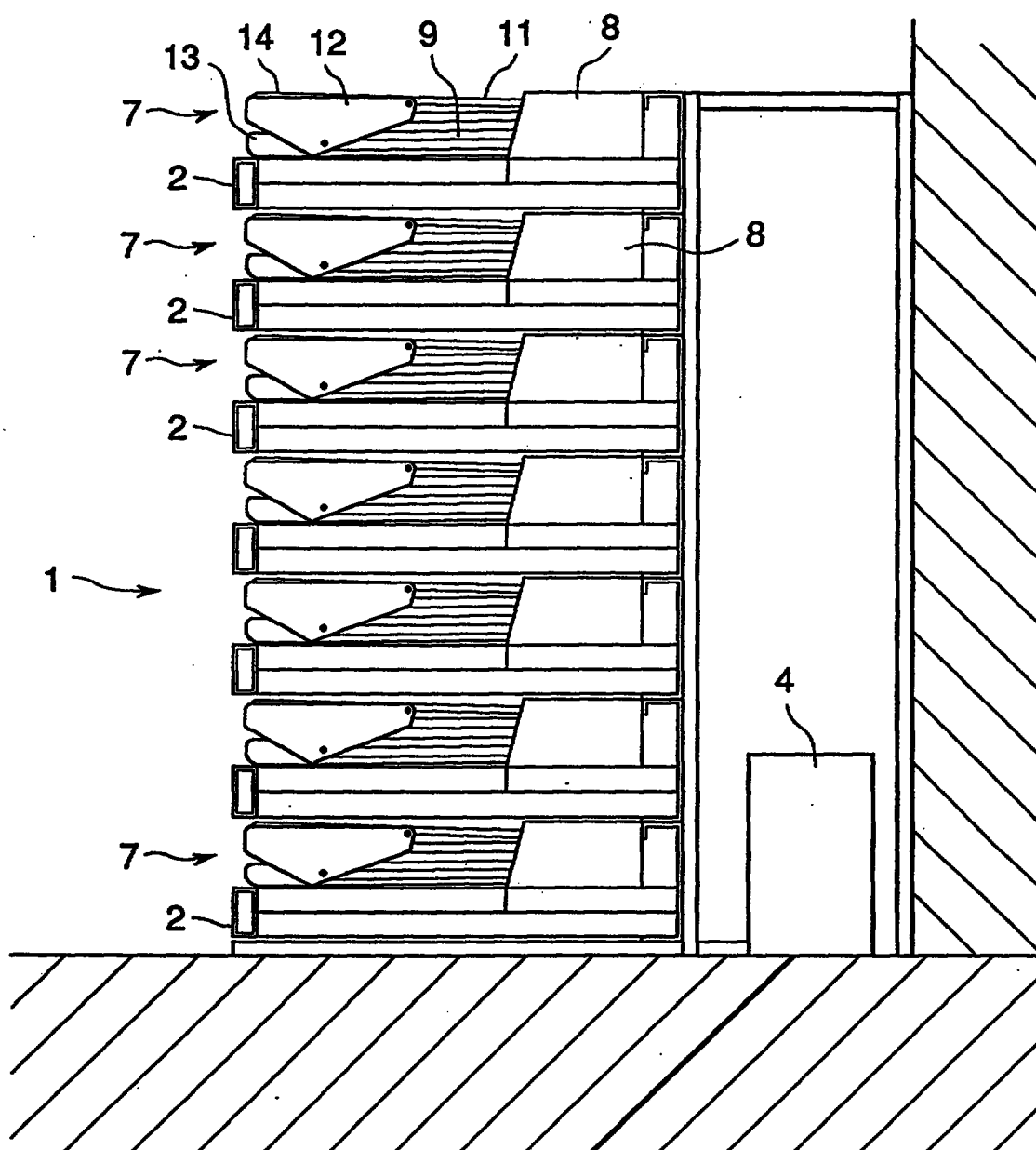
25

This Sheet Has Been Replaced.



Fig. 1





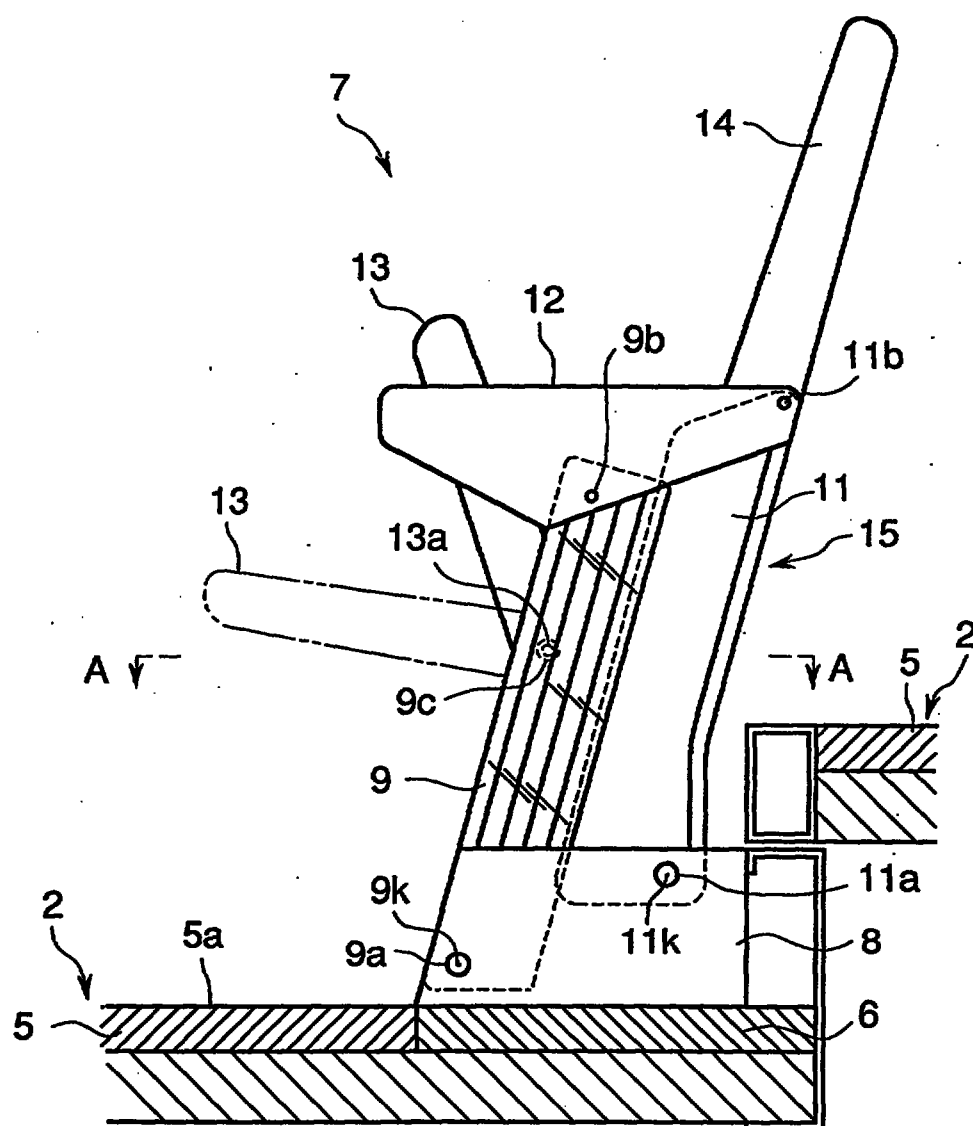


Fig. 4

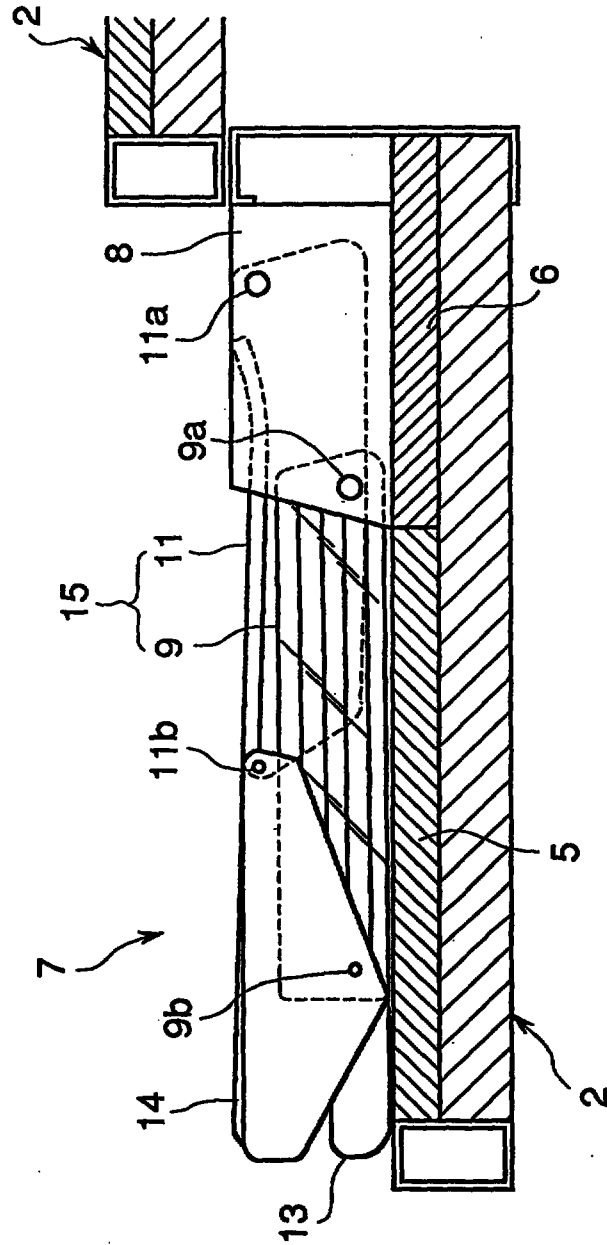


Fig. 5

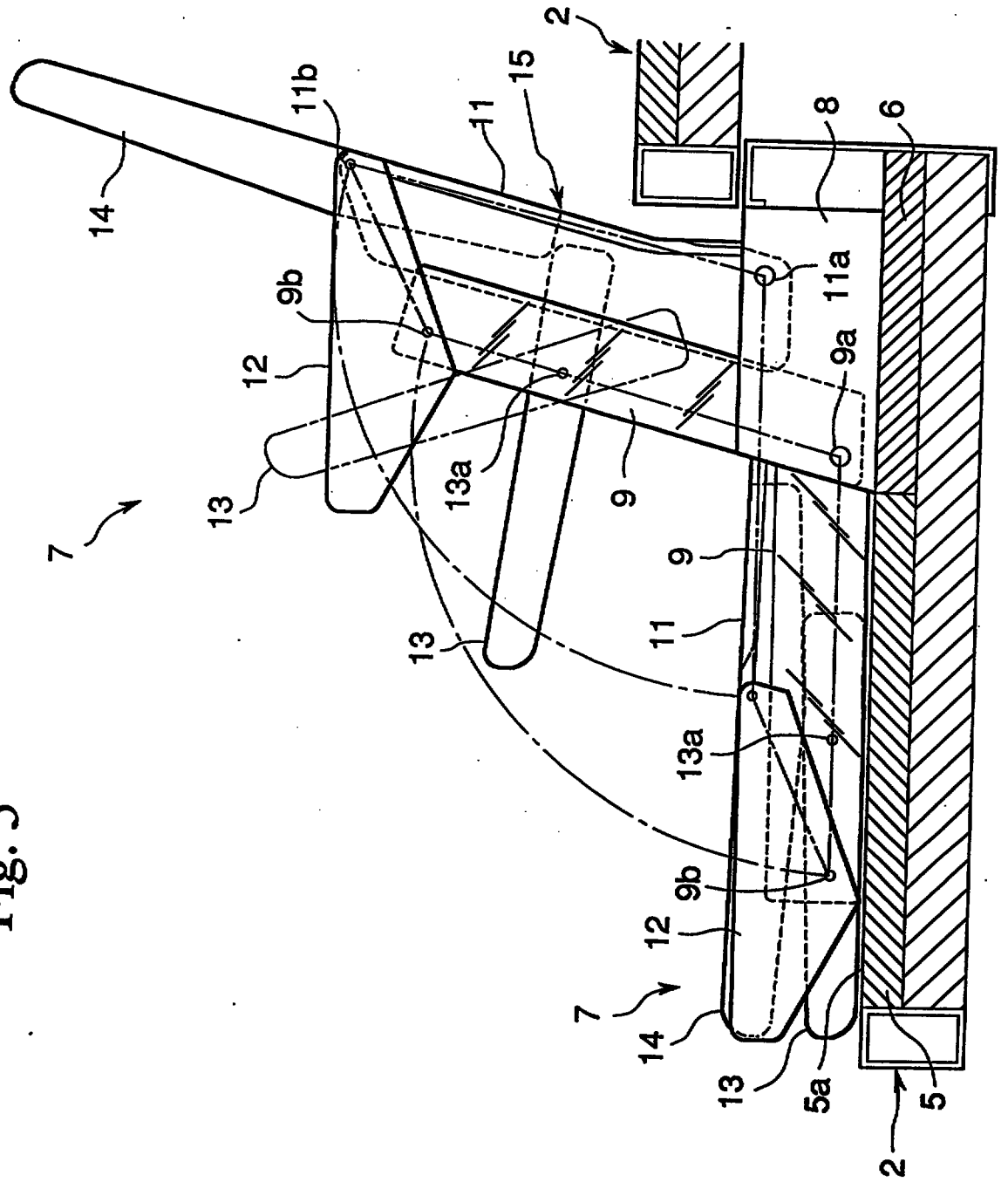
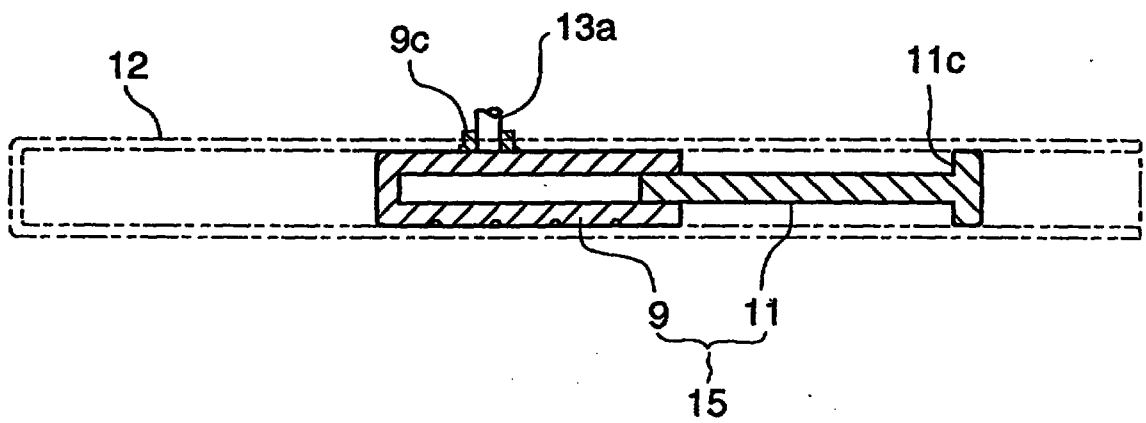
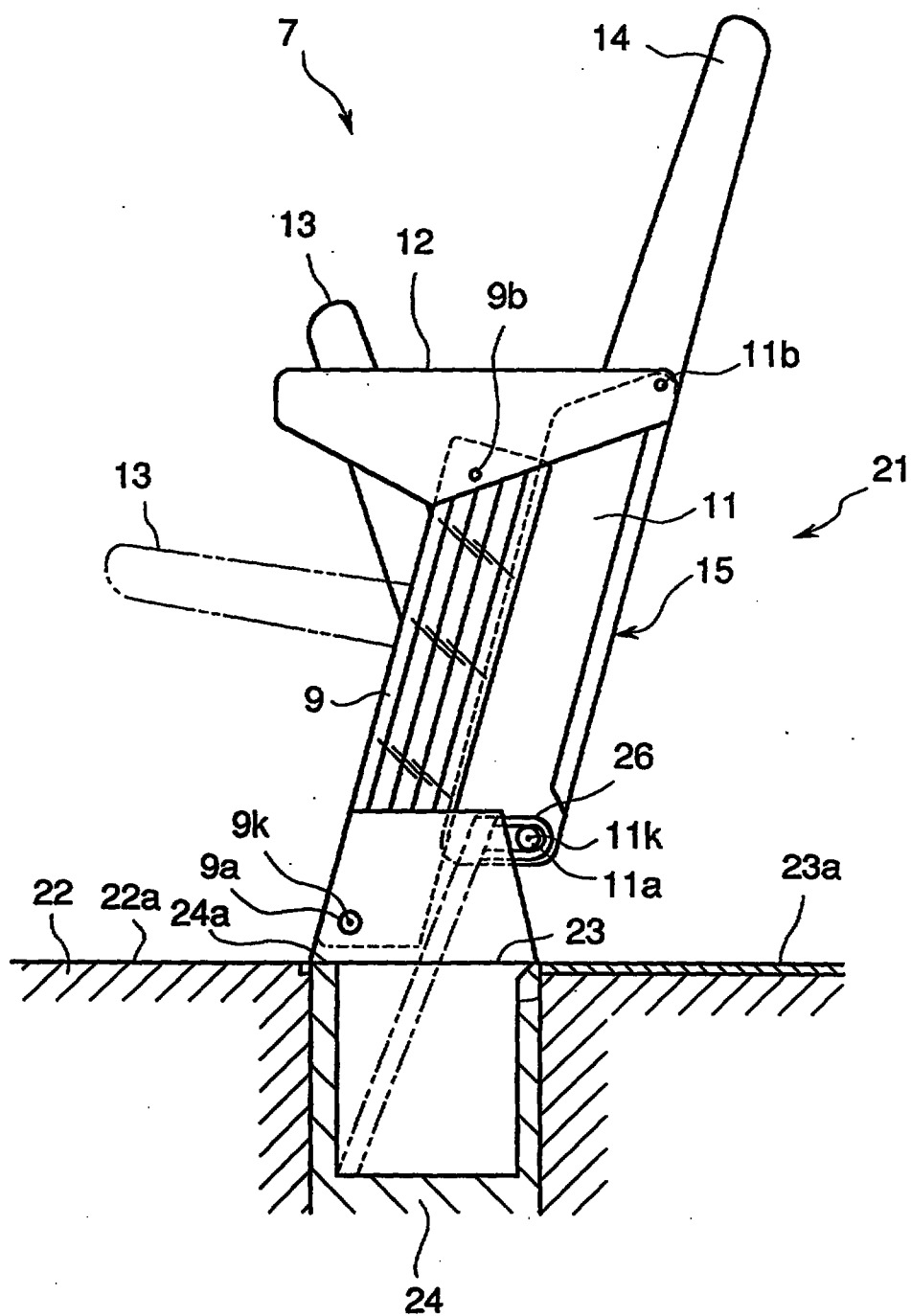


Fig. 6





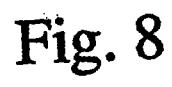
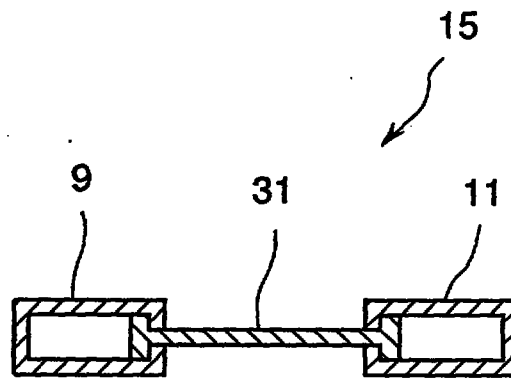


Fig. 9





A bleacher stand of a different design has been developed wherein foldable chairs are mounted on a lift mechanism that moves up and down between upper and lower positions. When it is intended to use the chairs, the lift
 5 mechanism remains in the upper position to hold the chairs out on the floor, and when not in use, the mechanism is retracted down to the lower position to keep the chairs stored under the floor. However, with this type of bleacher stand, it is impossible to employ chairs weighty in
 10 appearance and sturdy in construction since the storage opening made in the floor must be kept at a minimum size.

It is an object of the invention to provide a new and improved foldable chair which is capable of overcoming these and other problems.

15 DISCLOSURE OF THE INVENTION

In order to achieve this object, a preferred embodiment of the foldable chair of the present invention comprises a support base, a pair of first link members pivotally movable with respect to the base member, a second pair of link
 20 members mounted behind and in parallel to the first link members for pivotal movement with respect to the base member, a pair of armrests pivotally mounted to the upper ends of the first and second link members, a seat pivotally supported by the pair of first link members, and a backrest
 25 supported by the pair of second link members.

When it is intended to install the foldable chair of the invention on a single-stage, flat movable bleacher stand or a multi-stage, stepped movable bleacher stand, the

REPLACEMENT SHEETS SG

- ☒ Description : paged ..3.. to paged ..
☒ Claim(s) : paged ..15 to paged ..
☐ Drawing(s) : paged to paged
☒ Abstract : paged ..17 to paged ..

DATE OF RECEIPT ..23/7/96

3

REPLACED SHEETS SG

- ☒ Description : paged ...3... to paged
☒ Claim(s) : paged ...15... to paged
☐ Drawing(s) : paged to paged
☒ Abstract : paged ...17... to paged

DATE OF RECEIPT

23/7/96

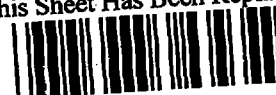
**CLAIMS:**

1. A foldable chair comprising a support base; a pair of legs each comprising a first link member pivotally movable with respect to the support base and a second link member mounted behind and in parallel to said first link member for pivotal movement with respect to said base member; an armrest pivotally mounted to the upper ends of said first and second link members; a seat pivotally supported at each of its opposite sides by said first link member; and a backrest supported at each of its opposite sides by said second link member.

2. The foldable chair according to Claim 1, wherein said support base is mounted on the floor of a bleacher stand movable between an extended position for use and a retracted position for storage, and said first and second link members are pivotable between a position where said chair stands upright for use on said floor and a position where said chair is folded lying flat on said floor.

3. The foldable chair according to Claim 1, wherein said support base is mounted on lifting means for moving said chair between a position for use on said floor and a position for storage under said floor, and said first and second link members are designed so that the relative positions of the lower pivot points of said first and second link members can be changed.

4. The foldable chair according to Claims 1, 2, or 3, wherein said first and second link members form a part or the whole of each said variable width support leg of said



23/7/96

ABSTRACT

Disclosed is a foldable chair of the type which is capable of being folded or collapsed into a compact configuration when not in use, while at the same time, is capable of giving a weighty and sturdy appearance when in use, for example, on a movable bleacher stand. The chair 7 comprises a support base 8 to be installed on a floor 2, a pair of legs each comprising a first link member 9 pivotally mounted for a to-and-fro swing motion with respect to the support base 8 and a second link member 11 pivotally mounted behind the first link member 9 essentially in parallel therewith for a to-and-fro swing motion with respect to the support base 8, an armrest 12 pivotally connected to the upper ends of the first and second link members, a seat 13 pivotally supported at each of its lateral sides by the first link member 9, and a backrest 14 supported at each of its opposite lateral sides by the second link member 11.

This Sheet Has Been Replaced



A bleacher stand of a different design has been developed wherein foldable chairs are mounted on a lift mechanism that moves up and down between upper and lower positions. When it is intended to use the chairs, the lift mechanism remains in the upper position to hold the chairs out on the floor, and when not in use, the mechanism is retracted down to the lower position to keep the chairs stored under the floor. However, with this type of bleacher stand, it is impossible to employ chairs weighty in appearance and sturdy in construction since the storage opening made in the floor must be kept at a minimum size.

It is an object of the invention to provide a new and improved foldable chair which is capable of overcoming these and other problems.

15 DISCLOSURE OF THE INVENTION

In order to achieve this object, a preferred embodiment of the foldable chair of the present invention comprises a support base, a pair of first link members pivotally movable with respect to the base member, a second pair of link members mounted behind and in parallel to the first link members for pivotal movement with respect to the base member, a pair of armrests pivotally mounted to the upper ends of the first and second link members, a seat pivotally supported by the pair of first link members, and a backrest fixedly supported by the pair of second link members.

When it is intended to install the foldable chair of the invention on a single-stage, flat movable bleacher stand or a multi-stage, stepped movable bleacher stand, the

REPLACEMENT SHEETS		SG
☒	Description	: paged 3.7/13 to paged 7
☒	Claim(s)	: paged 15 to paged 17
☐	Drawing(s)	: paged 1 to paged 1
☒	Abstract	: paged 17 to paged 17
DATE OF RECEIPT		18/11/96

and rearward pivotal movement with respect to the support base 8, an armrest 12 pivotally connected to the upper ends of the first and second link members 9 and 11, a seat 13 pivotally supported by the first link member 9, and a backrest 14 fixedly supported by the second link member 11.

More specifically, the first link member 9 is in the form of a flat rectangular hollow post with one narrower side removed for the purpose hereinbelow explained, giving it a U-shaped horizontal cross section as shown in FIG. 6.

The first link member 9 has its lower end pivotally connected to the support base 8 by means of an axle or shaft 9a for to- and-fro swing motion between its generally upright position for use and its horizontal position for stacked storage (see FIG. 5). The second link member 11 is in the form of a flat plate having a longitudinal rib 11c integrally made along its rear edge, and has its front edge slidably inserted within the first link member 9 through its open side. Thus, the first and second link members 9 and 11 together form a support leg 15 of the foldable chair. As in the case of the first link member 9, the second link member 11 also has its lower end pivotally connected to the support base 8 by means of an axle 11a.

The armrest 12 comprises a hollow box-like member with its lower and rear sidewalls removed. The armrest 12 is snugly fitted over the upper ends of the first and second link members 9 and 11. It is also pivotally mounted at its middle portion to the upper end of the first link member 9 by means of an axle 9b, and at its rear portion to the upper

only the first and second link members constitute the leg collapsible widthwise, an additional component part may be employed as shown in FIG. 9. The support leg 15 of FIG. 9 comprises the first and second link members 9 and 11, both of which have a generally U-shaped horizontal cross-section, and an interconnecting plate 31 engageably fitted into the link members for relative sliding movement. The first and second link members 9 and 11 are interconnected by the plate 31 so that their relative movement may effectively reduce the overall configuration or size of the support leg 15. In lieu of the interconnecting plate 31, resilient cloth or accordion fold means may suitably be used to connect the first and second link members together. Alternatively, a space may be provided between the first and second link members.

Although the link members are explained hereinabove as being of different length, they may have an equal length.

20

While several preferred embodiments of the invention have been described in detail hereinabove, such description is for illustrative purposes only, and it is to be understood that changes and modifications may be made without departing from the spirit or scope of the invention.

POSSIBLE APPLICATIONS IN INDUSTRY

From the foregoing description, it is seen that the chair constructed according to the invention is particularly



REPLACEMENT SHEET
18/11/96

CLAIMS:

1. A foldable chair comprising a support base; a pair of legs each comprising a first link member pivotally movable with respect to the support base and a second link member mounted behind and in parallel to said first link member for pivotal movement with respect to said base member; an armrest pivotally mounted to the upper ends of said first and second link members; a seat pivotally supported at each of its opposite sides by said first link member; and a backrest fixedly supported at each of its opposite sides by said second link member.

2. The foldable chair according to Claim 1, wherein said support base is mounted on the floor of a bleacher stand movable between an extended position for use and a retracted position for storage, and said first and second link members are pivotable between a position where said chair stands upright for use on said floor and a position where said chair is folded lying flat on said floor.

3. The foldable chair according to Claim 1, wherein said support base is mounted on lifting means for moving said chair between a position for use on said floor and a position for storage under said floor, and said first and second link members are designed so that the relative positions of the lower pivot points of said first and second link members can be changed.

4. The foldable chair according to Claims 1, 2, or 3, wherein said first and second link members form a part or the whole of each said variable width support leg of said

ABSTRACT

Disclosed is a foldable chair of the type which is capable of being folded or collapsed into a compact configuration when not in use, while at the same time, is capable of giving a weighty and sturdy appearance when in use, for example, on a movable bleacher stand. The chair comprises a support base 8 to be installed on a floor 2, a pair of legs each comprising a first link member 9 pivotally mounted for a to-and-fro swing motion with respect to the support base 8 and a second link member 11 pivotally mounted behind the first link member 9 essentially in parallel therewith for a to-and-fro swing motion with respect to the support base 8, an armrest 12 pivotally connected to the upper ends of the first and second link members, a seat 13 pivotally supported at each of its lateral sides by the first link member 9, and a backrest 14 fixedly supported at each of its opposite lateral sides by the second link member 11.

20

25