July 26, 1966 H. W. BLACK ETAL 3,262,733

TABLE AND SUSPENDED CHAIR UNIT

Filed July 6, 1965 2 Sheets-Sheet 1

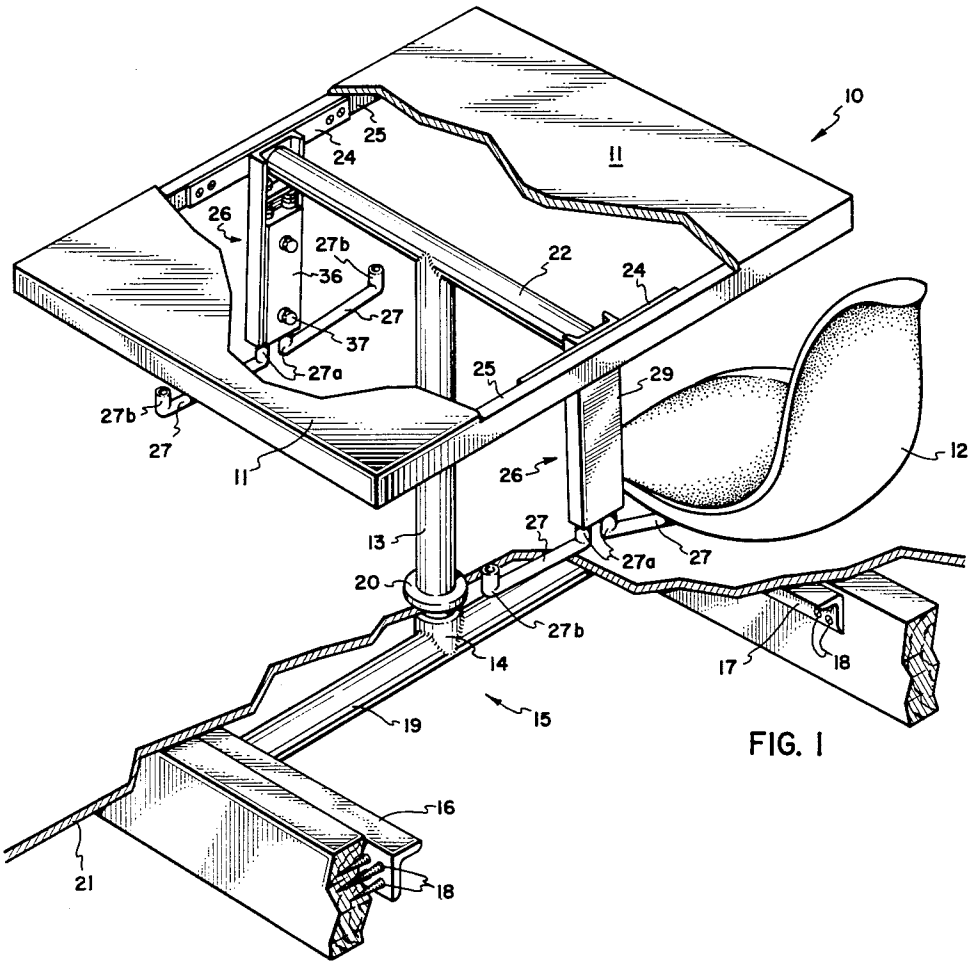


FIG. 1

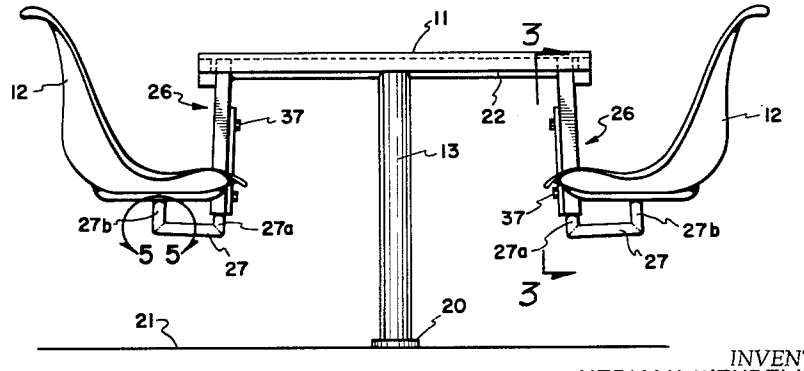


FIG. 2

INVENTORS:
HERMAN WENDELL BLACK
KAE DERHAM BLACK
BY Mallinckrodt and Mallinckrodt
ATTORNEYS

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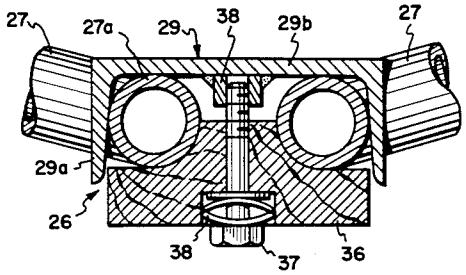


FIG. 4

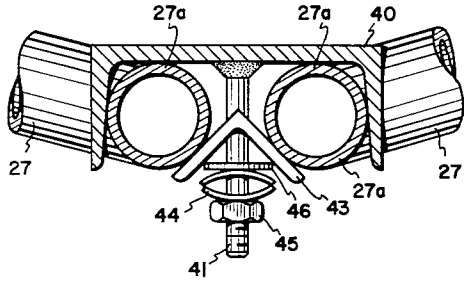


FIG. 6

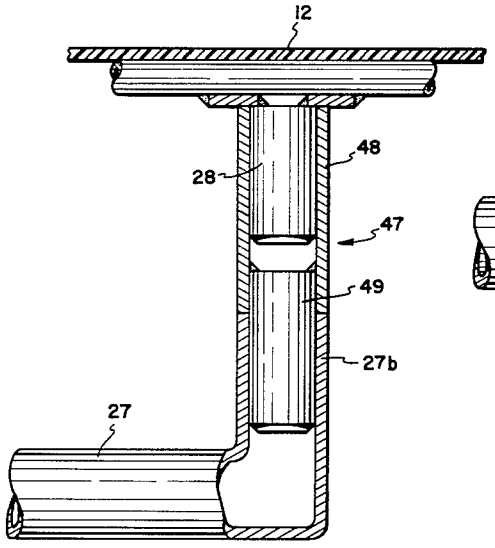


FIG. 5

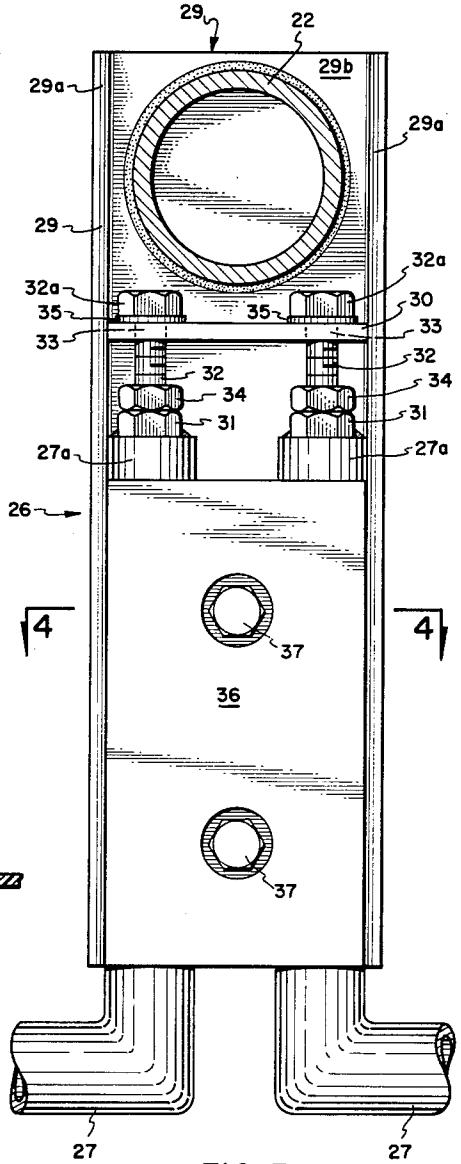


FIG. 3

INVENTORS:
HERMAN WENDELL BLACK
KAE DERHAM BLACK
BY Mallinckrodt and Mallinckrodt
ATTORNEYS

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TABLE AND SUSPENDED CHAIR UNIT

Herman Wendell Black and Kae Derham Black, both of Blackfoot, Idaho, assignors of thirty-five percent to Richard R. Wright, Idaho Falls, Idaho

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9 Claims. (Cl. 297—142)

This is a continuation-in-part of application Serial No. 348,043, filed February 28, 1964, now abandoned.

The present invention relates to combined table and seat units and is especially concerned with a unit of the type wherein one or more chairs are suspended from a table structure.

Conventional arrangements, including a table and separate chairs, involve a number of legs on the table and additional legs on each chair. The numerous legs make it very difficult to clean floor areas beneath the table and chairs, especially without marring the legs. Furthermore, it is frequently impossible to store the chairs beneath the table and it is necessary to move the chairs to and from the table each time they are used.

In the past there have been combined table and seat units proposed, and these have overcome some of the problems inherent in separate table and chair arrangements. However, the combined table and seat units with which we are familiar are not entirely satisfactory from one or more standpoints. Thus, the tables may include corner legs that obstruct cleaning operations and/or the table may not be adapted to be securely mounted such that it will be stable even if the seats are loaded unevenly. In addition, the structure used to support the seats often obstructs a user moving on or off the seat and makes it difficult for him to properly position and maintain himself with respect to the table.

Objects of the present invention are to provide a combined table and seat unit wherein the seats are conveniently positioned beneath the table when they are not in use and wherein a maximum clear area is provided therebeneath so that cleaning operations are not obstructed. Further objects are to provide a unit wherein the seats are suspended from the table in such a manner that they tend to pivot to the storage position beneath the table when they are unoccupied, but tend to maintain a set position when they are occupied.

Outstanding features of the present invention include a central post support for both a table top and seats associated with the table top. The seats are carried by an arm journaled for rotation with respect to a downwardly extending, outwardly inclined, seat support bracket that includes a friction braking assembly. With this arrangement the seats tend to swing under the table top when they are unoccupied but the braking force opposes swinging when the seats are occupied.

There are shown in the accompanying drawings specific embodiments of the invention representing what are presently regarded as the best modes of carrying out the generic concepts in actual practice. From the detailed description of these presently preferred forms of the invention, other more specific objects and features will become apparent.

In the drawings:

FIG. 1 is a perspective view of the invention, partially broken away to show mounting details;

FIG. 2, a side elevation;

FIG. 3, a fragmentary vertical section taken on the line 3—3 of FIG. 2;

FIG. 4, a horizontal section taken on the line 4—4 of FIG. 3;

FIG. 5, a fragmentary and partially broken away view taken within the line 5—5 of FIG. 2, and showing a side elevation of a typical seat and its mounting on a seat-support arm, and including a seat height extender; and

FIG. 6, a view like FIG. 4, but showing another embodiment of the friction brake.

Referring now to the drawings:

In the embodiment illustrated in FIGS. 1–4, the table and seat unit of the invention is shown generally at **10** and includes a table top **11**, and a plurality of suspended seats **12**, all indirectly supported by a central upright post **13**. Post **13** is threaded into a coupling **14** of a sub-floor mounting assembly shown generally at **15**.

The sub-floor mounting assembly comprises an H frame anchor member having a pair of angle irons **16** and **17** drilled with holes so that screws **18** can be passed through and screwed into the floor joists of the building in which the unit is to be mounted. A cross tube **19** is fixed to each of the angle irons, as by welding, and coupling **14** is rigidly fixed thereto. It should be obvious that for other types of sub-floor constructions, other types of anchor members can be used. In all cases, however, the coupling **14** must be positioned to hold central post **13** in a vertical position.

A pipe ring **20** surrounds central post **13** and rests on the building floor **21** to provide an attractive cover for the opening made through the floor to accommodate post **13**.

A horizontally extending arm **22** is fixed to upright post **13** at its upper end to directly support table top **11** and one or more of the suspended seats. Horizontally extending braces **24** are fixed to arm **22** and are screw connected to the inner faces of side aprons **25** of the table top.

The seats **12** are each suspended through a seat support bracket **26** connected to one of the arms **22** beneath the edge of the table, and by a seat supporting arm **27** that has one end **27***a* journaled for rotation in a seat support bracket and the other end **27***b* journalling a post **28**, FIG. 5, that is fixed to and depends from the bottom of a seat.

Seat support brackets **26** each include a channel member **29** that is welded to arm **22** and that extends downwardly and slightly outwardly with respect to table top **11**. A bearing plate **30** extends across the channel member **29**, between the flanges **29***a*, to provide a bearing surface for a pair of the seat supporting arms **27**.

Each arm **27** has a nut **31** welded to its end **27***a* so that a bolt **32**, passing downwardly through holes **33** in bearing plate **30**, can be screwed into the nut. A lock nut **34** on the bolt is turned down tight against nut **31**, and the bolt will then rotate with the arm **27**. A replaceable bearing washer **35** is positioned between the head **32***a* of bolt **32** and bearing plate **30** to take the wear resulting from horizontal swinging of arm **27**.

In the embodiment illustrated in FIGS. 1–4 the upwardly extending end **27***a* of arm **27** is normally held in position adjacent the web **29***b* and one flange **29***a* of channel member **29** by a block **36** that slides on bolts **37**. Bolts **37** are threaded into nuts **38** fixed to the web **29***b* of channel member **29**, and a spring **38**, FIG. 4, is positioned between the block and the head of each bolt to normally bias the block against the end **27***a* of arm **27** and the arm against the channel member **29**.

The frictional engagement between the block, the arm, and the channel member provides a resistance force to horizontal rotation of the arm **27**, but when the seat at the opposite end **27***b* of arm **27** is unoccupied this resistance force is not great enough to overcome the natural tendency of the arm to swing the seat under the table, resulting from the slight outward sloping of the seat support bracket with respect to the table. Post **28**, depending from the seat into end **27***b* of arm **27**, is angled such

that the seating portion of the seat will be maintained in a substantially horizontal position.

When the seat is occupied, the lower portion of the upwardly extending end **27***a* of arm **27***b* is forced tightly against block **36**, which is then forced tightly against the head of bolt **27**, with the resulting frictional force acting as a brake that opposes undesired swinging of the arm. Of course, the frictional force is not sufficient to prevent a user forceably pivoting the arm to a desired position. Block **36** is preferably made of hardwood, but it should be apparent that other materials having the desired wear and frictional properties can be used.

In FIG. 6, there is illustrated another friction brake assembly that has been found very satisfactory. As in the previously disclosed embodiment, this assembly includes a channel member **40** against which the seat supporting arm **27** is lightly biased. A post **41** is welded to channel member **40**, and a V-shaped friction block **43** slides on post **41** so that each of its legs rests against one of the ends **27***a* of an arm **27**. A spring **44**, positioned between a nut **45** threaded on the end of post **41** and a flat washer **46** that engages the block provides the normal biasing force for holding the wedge against the arms **27** and the arms against the channel member. The tension can be varied as desired merely by turning nut **45** and changing the compression of spring **44**. When a seat is occupied the end **27***a* of its arm **27** is forced tightly against the friction block, which is then forced tightly against the nut **45** (with washer **46** and spring **44** therebetween) to apply a braking force opposing horizontal swinging of the seat supporting arm.

Extender members **47**, FIG. 5, are provided as a very inexpensive and effective way of changing the elevation of the seats. Each extender member includes upper and lower cylindrical sections **48** and **49**, respectively, with the lower section having an outside diameter small enough to easily fit into the tubular bore of end **27***b* of seat supporting arm **27** and the upper section having an inside diameter large enough to easily receive the depending post **28** of a seat.

As has been noted, two seats are easily suspended from a single seat-support bracket and the same brake mechanism will act to prevent undesired horizontal swinging of arms carrying such seats.

With the seat suspension and braking arrangement of the invention, the support structure for the seat is well out of the way of a user as he swings toward and away from the table top, and the seat will be maintained in any set position, without a tendency to "float" the user away from the table. Also, with this arrangement, there is only a central support post for the table top and seats that must be avoided during cleaning of the floor beneath them, and the seats are positioned beneath the table top where they are easily accessible when they are not being used.

Whereas there are here illustrated and specifically described a certain preferred construction of apparatus which is presently regarded as the best mode of carrying out the invention, it should be understood that various changes may be made and other constructions adopted without departing from the inventive subject matter particularly pointed out and claimed herebelow.

We claim:

1. In combination, a table top; support means therefor including an upright post, an arm rigidly secured to the upper end of said post and extending substantially horizontally outwardly therefrom, and means fixing said table top above said post and on said arm for support thereby; seat suspending means adjacent the free end of the arm, said means including a seat support bracket depending downwardly from said arm and providing a pivot axis, and a seat supporting arm extending substantially horizontally outwardly from the lower end of the seat support bracket and being mounted for rotation about the pivot axis; and a seat pivotally mounted on the end of the seat supporting arm remote from the seat support bracket.

2. The combination of claim **1**, wherein the seat support bracket includes brake means responsive to the weight of a person on the seat to retard horizontal swinging of the seat supporting arm about the pivot axis.

3. The combination of claim **1**, wherein the end of the seat supporting arm remote from the seat support bracket comprises an upwardly extending tubular section; and wherein the seat includes a post depending downwardly from the bottom of said seat and into the tubular section.

4. The combination of claim **3**, wherein at least one extender member is positioned between the tubular section and the seat, said extender member being formed of upper and lower cylindrical sections, the lower section having an outside diameter small enough to fit in the bore of said tubular section and the upper section having a bore adapted to receive the post depending from said seat.

5. The combination of claim **1**, wherein the support means for the table top further includes an anchor member adapted to be connected to a building sub-structure; and means detachably interconnecting the upright post to the anchor member.

6. The combination claim **1**, wherein the pivot axis is inclined downwardly and outwardly with respect to the table top and forms a substantially ninety-degree angle with respect to the seat supporting arm.

7. In combination, a table having a table top; a seat support bracket; means mounting said bracket to depend downwardly from beneath the edge of the table top; a pair of seat supporting arms, each including a pair of upwardly extending portions interconnected by a intermediate section, one of said upwardly extending portions being carried by and journaled for rotation in said bracket and the other forming a seat retainer member, the intermediate section extending normal thereto; a seat supported by and journaled for rotation in the end of said seat supporting arm forming a seat retainer; and brake means carried by said bracket to apply a normal braking force to rotation of said seat supporting arms, said braking force being increased as a result of an increased weight on said seat.

8. The combination of claim **7**, wherein the brake means includes adjustment means to vary the normal braking force tending to retard rotation of the seat supporting arms.

9. A table and suspended seating construction including in combination; a table top; means fixedly disposed with respect to and depending from said table top for supporting said table top; plural, spaced suspension arms each having an upwardly directed vertical portion, and an outwardly directed horizontal portion; bearing support means fixed beneath said table top; spaced bearing means carried by said bearing support means and each journaling an upwardly directed vertical portion of one of said suspension arms; and a seat rotatably mounted on the free end of each suspension arm.

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FRANK B. SHERRY, *Primary Examiner.*

J. T. McCALL, *Assistant Examiner.*