April 25, 1967 R. C. STITH 3,316,018

EXPANSIBLE CHAIR

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Fig. 1.

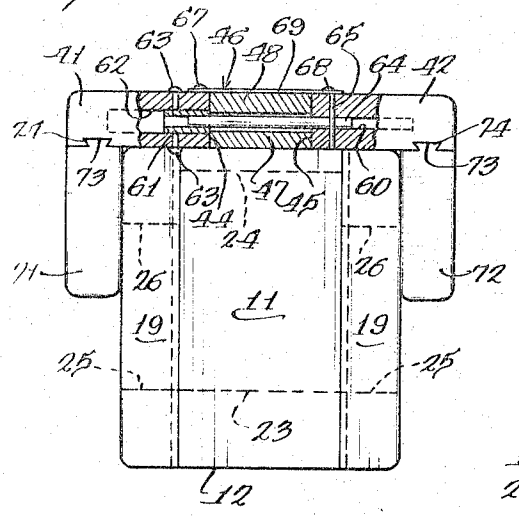


Fig. 2.

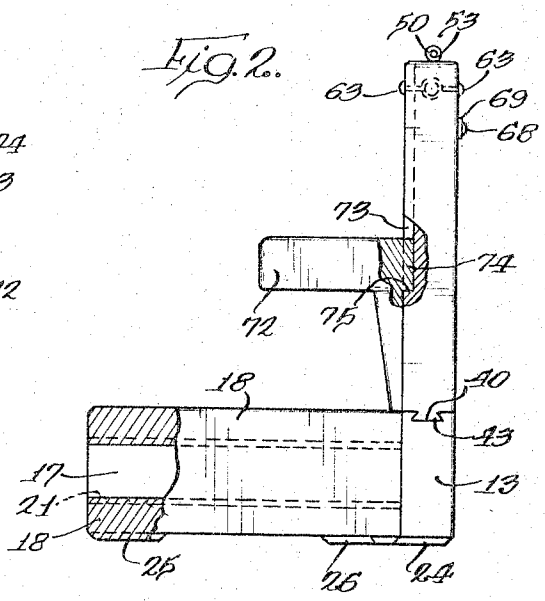


Fig. 3.

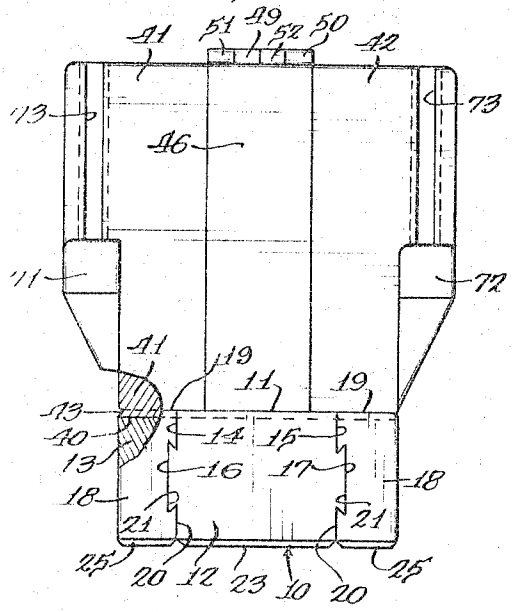
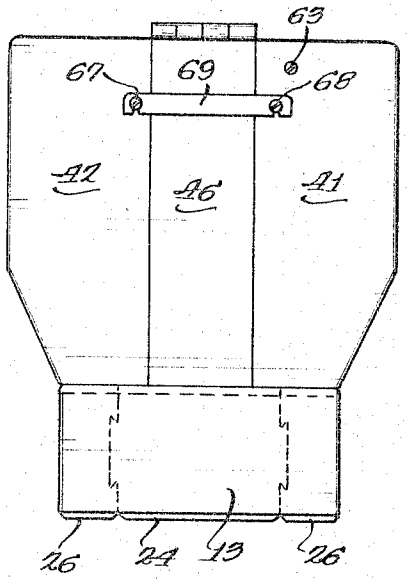


Fig. 4.



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Allen, Stellman & McCord
Attys

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Fig. 5.

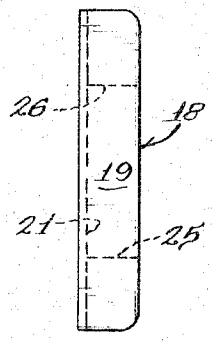


Fig. 6.

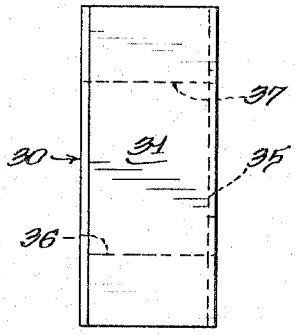


Fig. 7.

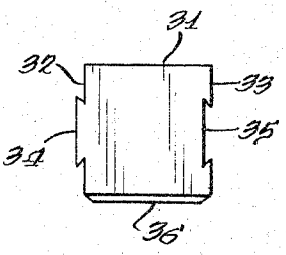


Fig. 8.

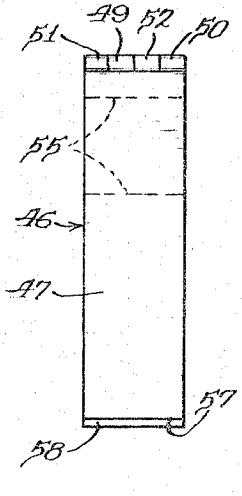


Fig. 9.

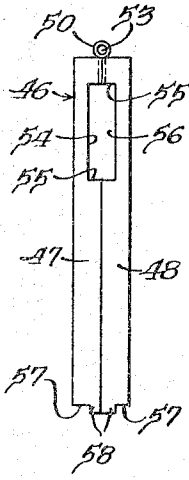


Fig. 10.

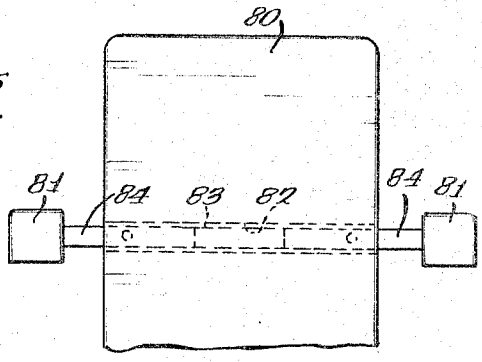
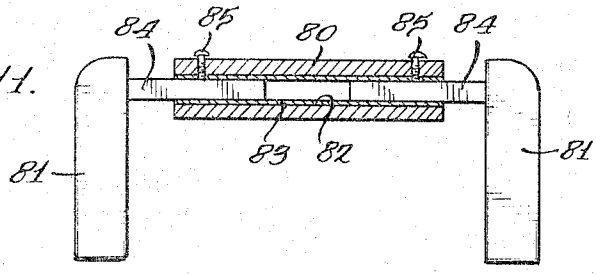


Fig. 11.



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Fig. 12.

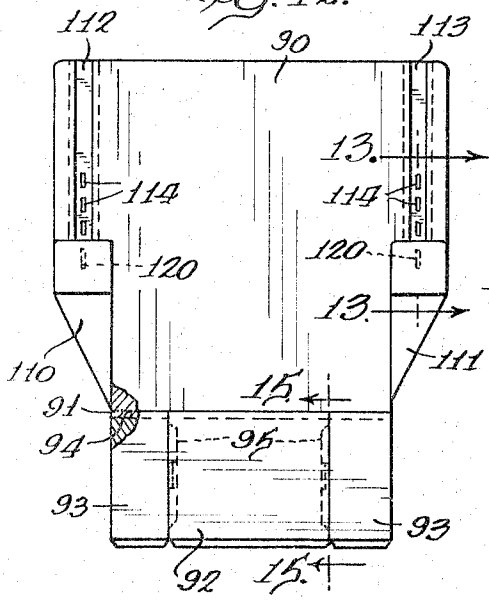


Fig. 13.

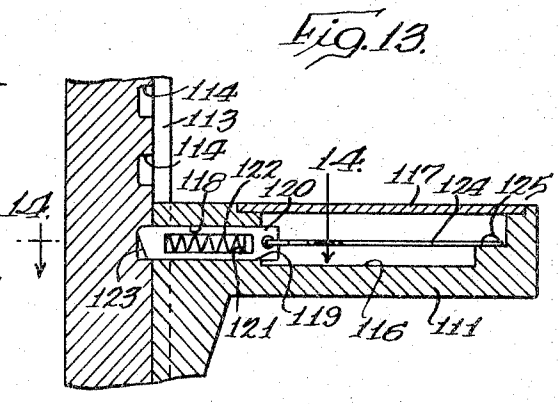


Fig. 14.

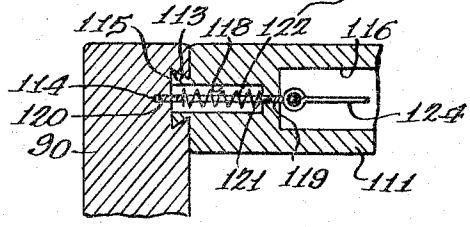


Fig. 15.

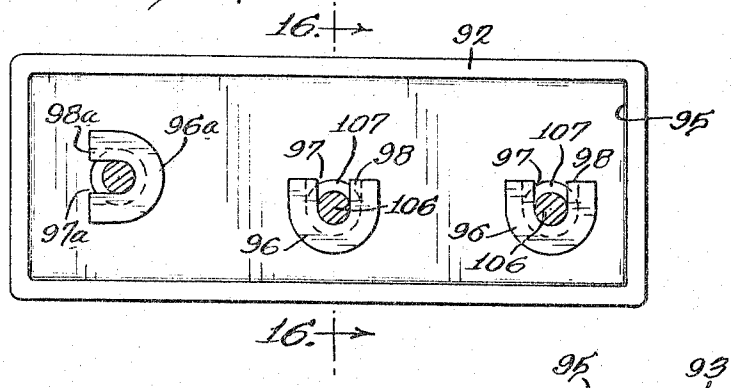
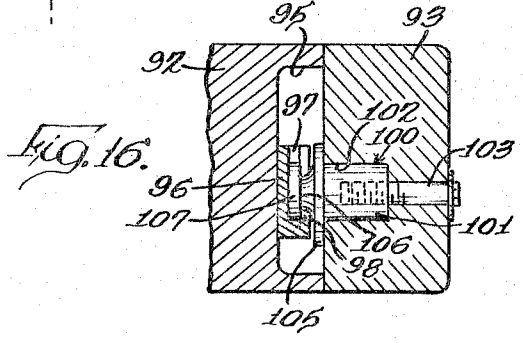


Fig. 16.



United States Patent Office 3,316,018 Patented Apr. 25, 1967

3,316,018

EXPANSIBLE CHAIR

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Filed Feb. 23, 1966, Ser. No. 536,514
7 Claims. (Cl. 297—440)

This application is a continuation-in-part of application Ser. No. 399,447, filed Sept. 26, 1964, and entitled, Expansible Chair.

This invention relates in general to expansible furniture, and more particularly to a chair which is capable of being expanded into a larger chair, a loveseat, or a sofa.

In the furniture industry, there has been a long felt need for a practical type of expansible furniture, so that the size of the furniture may be varied to fit the needs of the individual user, and to convert pieces of furniture from one type of furniture to another. Heretofore, various types of expansible furniture have been suggested, but none have met with wide commercial acceptance because the rather complex mechanisms which have been used to expand the furniture have rendered the furniture expensive to manufacture and maintain. Also, in known types of expansible furniture, it has been a difficult and time consuming chore to expand the furniture from one position to another.

In certain known types of expansible furniture, rather complex frames are associated with different furniture elements, and roll upon one another from an expanded to a contracted position, and vice versa. Such furniture is typified by that shown in the patent to Leary et al. No. 2,699,202. While such devices have in general functioned satisfactorily to provide expansible furniture, the high initial cost, and the difficulty encountered in moving the frame elements relative to one another has rendered these devices much less than completely satisfactory. Other types of expansible furniture, and more particularly, in other types of expansible chairs, it is conventional to provide plurality of "strips" which are positioned on transversely extending connecting members. Such expansible chairs are typified by those shown in the patents to De Frehn No. 1,650,697 and McGregor 3,131,970. This type of expansible chair has the inherent disadvantage of being difficult and time consuming to convert from one size of chair to another.

Accordingly, the general purpose of the present invention is to provide an improved expansible furniture construction which obviates the problems encountered in known devices, while being simple in construction, and relatively inexpensive to manufacture and maintain.

An object of the invention is to provide an expansible chair which includes a minimum number of movable parts so that the chair will function satisfactorily for a long period of time, and will not be susceptible to mechanical failure.

A further object of the invention is to provide an expansible chair that is constructed of a plurality of readily removable elements, so that the chair can be assembled and disassembled in a minimum amount of time.

Another object of the invention is to provide an expansible chair as defined in the preceding paragraph with component parts of relatively small size, so that the chair can be disassembled and stored without occupying a large amount of space.

Other objects and advantages of the invention will hereinafter become more fully apparent from the following description taken in connection with the annexed drawing:

FIG. 1 is a top plan view of a preferred embodiment of the invention shown in an expanded position, with certain parts broken away for clarity;

FIG. 2 is a side elevational view of the chair illustrated in FIG. 1;

FIG. 3 is a front elevational view of the chair illustrated in FIGS. 1 and 2;

FIG. 4 is a rear elevational view of the chair illustrated in FIGS. 1–3;

FIG. 5 is a top plan view of one type of seat expansion member;

FIG. 6 is a top plan view of another type of seat expansion member;

FIG. 7 is an end view of the extension member illustrated in FIG. 6;

FIG. 8 is a front elevational view of a back insert member;

FIG. 9 is a side elevational view of the insert member shown in FIG. 8;

FIG. 10 is a fragmentary front view of a modified chair construction;

FIG. 11 is a top plan view of the embodiment illustrated in FIG. 10, with certain parts being shown in section;

FIG. 12 is a front elevational view, similar to FIG. 3, and showing a further embodiment of the invention;

FIG. 13 is a sectional view taken generally along line 13—13 of FIG. 12;

FIG. 14 is a sectional view taken generally along line 14—14 of FIG. 13;

FIG. 15 is a view taken generally along line 15—15 of FIG. 12; and

FIG. 16 is a sectional view taken generally along line 16—16 of FIG. 15.

While this invention is susceptible of embodiment in many different forms, there is shown in the drawing and will herein be described in detail a preferred embodiment and modifications thereof, with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the embodiments illustrated. The scope of the invention will be pointed out in the appended claims.

Referring now to the drawing, wherein like reference characters designate like or corresponding parts throughout several views, the illustrated chair embodiment includes a first seat portion or base **10** having an upper surface **11**, and a lower surface generally parallel thereto. First seat portion **10** is generally T-shaped in plan view and includes a forwardly extending portion **12**, and a rear portion **13** transverse thereto. The upper surface **11** of the forwardly extending portion **12** may be provided with suitable cushioning material, if desired, as is well known in the art.

The opposite longitudinally extending sides **14** and **15** of forwardly extending portion **12** are each provided with guide means for slidably receiving expansion members. In the illustrated embodiment, the respective guide means are dovetail tongues **16** and **17**.

In FIGS. 1–4, seat expansion members **18** are shown mounted on the opposite sides **14** and **15** of the first seat portion **10**. Expansion members **18** include an upper surface **19** and a lower surface generally parallel thereto. As is well known in the art, the upper surfaces **19** of the expansion members may also be provided with suitable cushioning material, if desired. Each expansion member **18** includes guide means in one longitudinal side **20** thereof, and in the illustrated embodiment, the guide means is a dovetail groove **21** which is adapted to slidably receive the outwardly extending tongue on the side **14** or **15** of the first seat portion **10**. As can be best seen in FIGS. 2 and 3, expansion members **18** are substantially the same thickness as first seat portion **10**, so that the upper surfaces **11** and **19** are generally horizontally aligned to define a continuous support surface. Dove-

tail tongues 16 and 17 and grooves 21 are sized so that the expansion members 18 may be moved longitudinally along the first seat portion 10 without difficulty, however, the tongues fit sufficiently tightly within the grooves to firmy hold the expansion members on the first seat portion. It should also be kept in mind that the tongues and grooves may be reversed, that is, the tongues may be provided on the expansion members while the grooves may be provided on the first seat portion.

Suitable legs are provided for supporting the seat structure on the floor, and in the illustrated embodiment a transverse leg 23 is provided at the forward end of the first seat portion 10, and a transverse leg 24 is provided at the rearward end of the first seat portion 10. For stabilizing purposes, legs 25 and 26 are provided at the forward and rearward ends respectively of the expansion members 18. It will be understood, of course, that if the expansion members 18 are not very wide, the legs 25 and 26 may be omitted. Alternatively, a suitable pedestal (not shown) may be provided on the lower surface of first seat portion 10 which would rest upon the floor, and in this event corresponding outrigger supports might be associated with the expansion members.

A second form of expansion member 30 is illustrated in FIGS. 6 and 7, and this expansion member may be termed an intermediate expansion member in distinction to the expansion members 18 which are terminal expansion members. Expansion member 30 is substantially the same thickness as the first seat portion 10, and includes an upper support surface 31, and a lower surface generally parallel thereto. The opposite longitudinally extending side faces 32 and 33 of extension member 30 are provided with a longitudinally extending dovetail tongue 34 and a longitudinally extending dovetail groove 35, respectively. Groove 35 is adapted to be longitudinally slidably received on one of the dovetail tongues on the first seat portion 10, while the dovetail tongue 34 is adapted to be received in a suitable dovetail slot in an additional intermediate or terminal expansion member. It will be readily understood that by providing a plurality of adjacent intermediate expansion members 30, the chair can be expanded from a relatively narrow chair to a relatively wide chair, to a loveseat, or even to a large sofa. As can be best seen in FIG. 6, the expansion member 30 is preferably provided with transverse legs 36 and 37 at the forward end rearward ends thereof respectively, to stabilize the same when it is assembled onto the chair first portion.

A back rest assembly is adapted to be provided at the rearward end of the chair seat portion, and to this end guide means are provided in the upper surface of the transversely extending seat portion 13. The back rest guide means include an upwardly open dovetail slot which extends transversely across the rearward portion 13 of the first seat portion 10. A pair of generally vertically extending back portions 41 and 42 are provided on opposite sides of seat portion 13, and each of the back portions 41 and 42 include guide means on the lower portion thereof in the form of a dovetail tongue 43. Back portions 41 and 42 include respective generally vertically extending surfaces 44 and 45, which are adapted to abut against one another when the chair is in its narrowest condition with no expansion members upon the first seat portion 10. It will be readily appreciated that when the seat portion of the chair is expanded, as by adding expansion members 18 or 30, the back rest members 41 and 42 are moved to the left and right respectively to expand the back rest portion. Dovetail tongues 43 and groove 40 are sized so that the back rest members 41 and 42 may be moved transversely along the first seat portion without difficulty, however, the tongues fit sufficiently tightly within the groove to firmly hold the back rest members on the seat.

When the chair is in the expanded position, a back insert member 46 is provided between back rest portions 41 and 42, and insert member 46 may be best understood from a consideration of FIGS. 8 and 9. Insert member 46 is formed of two generally identical portions 47 and 48 which are pivotally secured together adjacent their upper ends. To this end, spaced apertured ears 49 and 50 are provided on the upper end of insert portion 47, while spaced apertured ears 51 and 52 are provided on the upper end of insert portion 48. A pivot pin 53 impales the aligned apertures in ears 49–52 so that insert portions 47 and 48 are pivotally mounted relative to one another. Insert portions 47 and 48 are each provided with an aligned transversely extending recess which is defined by a bottom surface 54 and side surfaces 55. The facing recesses in the insert portions 47 and 48 collectively define a transverse opening 56 in the insert member 46 for a purpose to hereafter appear. An undercut shoulder 57 is provided at the lower end of each insert portion, and defines portions of reduced width 58 on each of the insert portions. The portions of reduced width 58 collectively define a foot for the insert member 46 which is receivable in the upwardly open groove 40, and the foot has a width which is sufficient to pass through the groove 40, yet it fits snugly within the groove to firmly hold the insert member 46 in place on the chair.

Means are provided adjacent the upper end of back rest portions 41 and 42 to guide the same in their lateral movement when the back rest is being expanded. In the illustrated embodiment the guide means takes the form of telescoping pipes, with a first pipe section 61 being held in a suitable recess 62 in back rest portion 41 by screws 63, and a second pipe section 64 being held in a suitable recess 60 in back rest portion 42 by a transverse pin 65. As can best be seen in FIG. 1, pipe section 64 is slidable within pipe section 61 as the back rest portions 41 and 42 move relative to one another to guide the same in their movement. Thus, after the back rest portions 41 and 42 have been moved relative to one another, one of the portions 47 or 48 of the insert member 46 is placed in position on the chair seat portion by first positioning the foot portion 58 thereon in the groove 40. The other insert portion is then pivoted relative to the insert portion in position so as to place the other foot portion 58 in the groove 40, and it will be understood that the upper walls 55 on the insert portion rest upon the transversely extending pipe sections 61 and 64.

Means are provided to securely hold the back rest members in position, once they have been expanded, and to this end rearwardly extending pins 67 and 68 are provided on back rest portions 41 and 42 respectively. As can be best seen in FIG. 4, a transversely extending latch bar 69, having arcuate notches in the lower portion thereof, extends between back rest portions 41 and 42 with the arcuate notches placed on pins 67 and 68 to hold back rest portions 41 and 42 in the adjusted position.

Means are provided on the front side of back rest portions 41 and 42 for supporting arm rests 71 and 72 respectively. This means includes generally vertically extending dovetail grooves 73, and correspondingly shaped dovetail tongues 74 are provided on the rearward surface of arm rests 71 and 72, and are slidable in grooves 73. As can be best seen in FIG. 2, tongues 74 extend only partially along the rearward surface of arm rests 71 and 72, and grooves 73 extend only partially along the surface of the back rest members. The grooves 73 terminate in a shoulder 75 normal to the length thereof which provides a stop for the lower portion of the dovetail tongues 74, to locate the arm rests 71 and 72 in the proper vertical position. Grooves 73 and tongues 74 are sized so that the arm rests 71 and 72 may be moved without difficulty, however the tongues fit sufficiently tightly within the grooves to hold the arm rests firmly in position on the chair back rest portions.

Turning now to the embodiment illustrated in FIGS. 10 and 11, a modified back structure is shown, wherein,

a single back member **80** is provided with laterally expansible arm rests **81**. It should be understood that the back structure of FIGS. 10 and 11 can be used with an expansible seat portion as shown in FIGS. 1–9, if desired. The arm rests **81** are carried by rods **84** that are slidably received in a transverse sleeve **83** having a bore **82**. Set screws **85** are provided in suitably threaded holes in the back rest portion **80** and sleeve **83** to retain the arm rests in their laterally adjusted position. Rods **84** and bore **82** are preferably rectangular in cross section, so that the arm rests **81** cannot rotate relative to the back member **80**.

Referring now to the embodiment of FIGS. 12–16, a further embodiment of the invention is illustrated wherein a unitary back member **90** is provided with a transversely extending tongue **91** at the lower end thereof, which has the grooves **94** in main seat member **92** and expansion seat members **93** slidable therealong, in a manner similar to the embodiment of FIG. 1. Further interfitting tongue and groove means on seat members **92** and **93** cooperate to slidably mount the expansion seat members **93** on main seat member **92**, with the tongue and groove means being arranged so that the upper surfaces of the seat members are generally horizontally aligned. The tongue and groove means will be best understood from a consideration of FIGS. 15 and 16, wherein a plurality of groove defining members are illustrated mounted in a recess **95** in one longitudinal side face of member **92**. The groove defining members in each recess **95** cooperate with outwardly extending tongue defining members carried by the expansion seat members **93**.

In the embodiment of FIGS. 12–16, the groove means includes a pair of longitudinally spaced, generally U-shaped detent members each having a vertically disposed slot **97** with a peripheral flange **98** therearound. The groove means further includes an additional generally U-shaped detent member **96***a*, preferably provided at the forward portion of recess **95**, and having horizontally disposed a slot **97***a* with a flange **98***a* extending around the periphery thereof. As is best seen in FIG. 15, the slot **97***a* is disposed slightly above the slots **97**, to facilitate the placement of the expansion members **93** on the member **92**.

The tongue means on member **93** includes a headed member **100** for each of the detent members, and each member **100** includes a body portion **101** seated within a bore **102** in the member **93**. Body portions **102** are preferably internally threaded, for cooperation with externally threaded fasteners **103** to positively secure the members **100** to the expansion seat members **93**. Members **100** each also preferably include an enlarged flange **105** which is drawn into engagement with the surface of member **93** facing members **92** by fasteners **103**. A reduced neck portion **106** is provided outwardly of flange **105**, and an enlarged head **107** is provided at the outer end of each member **100**. Heads **107** are sized so as to be freely slidable within the detent member slots, but the fit therebetween is close enough so that the expansion members **93** will be securely held on the main seat member **92**.

From the foregoing, it will be understood that when it is desired to place an expansion member **93** on the main seat member **92**, the head **107** at the outermost portion of member **93** is slid longitudinally into horizontal slot **97***a*, and the member **93** is then pivoted downwardly about the last mentioned head **107** to slidably engage the other heads **107** with the vertical slots **97**. Although it will be apparent that only one detent member **96** having a vertical groove **97** is necessary for proper functioning of the device; if it is desired, more than the two detent members **96** illustrated in FIG. 15 may be provided. It will also be apparent from the foregoing that the member **100** which cooperates with the detent member **96***a* is spaced slightly above the other members **100**, so that the upper surface of member **93** will be horizontally aligned with the upper surface of member **92**, as is seen in FIG. 16.

Suitable covers (not shown) may be provided over recesses **95**, when the expansion seat members **93** are not in use.

The embodiment of FIGS. 12–16 also includes means for vertically adjustably mounting a pair of arm rests **110** and **111**, and to this end a pair of vertically extending grooves **112** and **113** are provided at opposite sides of the back member **90**. Grooves **112** and **113** may be formed integrally within back **90** as illustrated, or separate grooved members secured to back **90** may be provided. A plurality of vertically spaced notches **114** are provided in each groove **113** for cooperation with detent means on arm rests **110** and **111** to retain the same in selected vertical positions. Each of the arm rests **110** and **111** includes a vertically extending tongue member **115** which is slidably receivable in the grooves **112** and **113**, respectively. The arm rests further include a longitudinally extending recess **116**, which is normally closed by removable cover **117**. A bore **118** opens rearwardly from each arm rest, and passages **119** establish communication between recesses **116** and bores **118**. A detent member **120** is slidable longitudinally in each bore **118**, and detent members **120** include a longitudinal slot **121** therein in which a spring **122** is seated. Each spring **122** bears against the wall at the end of bore **118**, and against the forward end of slot **121** to urge the detent member **120** outwardly of the bore **118** into a selected one of the notches **114**. The outer end of detent member **120** may be rounded or inclined as shown at **123** in FIG. 13, so that the arm rests can be adjusted downwardly merely by applying a desired amount of force downwardly thereto. Springs **122** are sufficiently strong that the detent members **120** securely hold the arm rests in place, and a substantial amount of downward force is necessary to overcome the resistance provided by springs **122**. Means are provided for retracting the detent members **120** inwardly of the arm rest so that the arm rest can be adjusted vertically, and this means includes a cable **124** having one end secured over a cable mount **125**, and the other end connected to the detent member **120**. Other suitable means, as will be readily recognized by those skilled in the art, may be provided for retracting the detent members **120**.

From the foregoing it should be apparent that applicant has provided an extremely versatile piece of furniture which is capable of being readily expanded by merely sliding expansion members in place. The chair is equally easy to disassemble, and when disassembled, it may be conveniently stored without occupying a large amount of space.

I claim:

1. Expansible furniture comprising: a first seat member having an upper surface adapted to support a person, and opposite longitudinal side faces; first guide means on each side face for slidably supporting an expansion seat member; expansion seat members, each having an upper surface adapted to support a person, and opposite longitudinal side faces; second guide means on at least one side face of each expansion seat member for longitudinal sliding coaction with the first guide means on one side face of said first seat member to removably mount said expansion seat members on said first seat member, the coacting guide means on the side faces of the first seat member and the expansion seat members being arranged so that the upper surfaces of the first seat member and the expansion seat members are generally horizontally aligned; third guide means extending transversely across said first seat member; back rest members, each having fourth guide means at the lower portion thereof slidably cooperating with said third guide means so as to mount said back rest members on said first seat member for movement toward and away from one another between an expanded and a contracted position; a back rest insert member, said back rest insert member being received between said back rest members when they are in the expanded position; fifth guide means

at the lower portion of said back rest insert member and cooperable with said first guide means to mount said back rest insert member on said first seat member; arm rests, one for each of the outermost back rest members, and each having sixth guide means on the rear surface thereof; and seventh guide means on each of the outermost back rest members slidably cooperating with said sixth guide means to removably mount said arm rests on said outermost back rest members.

2. Expansible furniture comprising: a first seat member having an upper surface adapted to support a person, opposite longitudinal side faces, and a transverse rear portion; expansion seat members, each having an upper surface adapted to support a person, and opposite longitudinal side faces; interfitting tongue and groove means on said first seat member and said expansion seat members to slidably mount said expansion seat members on said first seat member, said interfitting tongue and groove means being arranged so that the upper surfaces of the first seat member and the expansion seat members are generally horizontally aligned; back rest members, interfitting tongue and groove means at the lower portion of said back seat members and the rear portion of said first seat member slidably cooperating so as to mount said back rest members on said first seat member for movement toward and away from one another between an expanded and a contracted position; a back rest insert member, said back rest insert member being received between said back rest members when they are in the expanded position; means at the lower portion of said back rest insert member for mounting said back rest insert member on said base; arm rests, one for each of the outermost back rest members; and interfitting tongue and groove means on each arm rest and on each of said outermost back rest members for removably mounting said arm rests on said outermost back rest members.

3. Expansible furniture comprising: a back rest; seat structure extending generally forwardly from said back rest and defined by, a main seat member and at least one expansion seat member; means for mounting said expansion seat member on said main seat member including, at least two spaced groove defining members on one of said seat members, and at least two spaced tongue defining members on the other of said seat members, one of said groove defining members having the groove therein generally vertically disposed; a pair of arm rests; means on said back rest for vertically slidably mounting said arm rests thereon; and cooperating means on said arm rests and said back rest for releasably securing said arm rests at different vertical elevations on said back rest.

4. Expansible furniture as defined in claim 3 wherein said last named means includes first and second rows of vertically spaced notches in said back rest, one row for each arm rest, and a retractable latch member on each arm rest releasably engageable within a selected one of said notches.

5. Expansible furniture as defined in claim 4 wherein one edge of said latch members includes a camming surface whereby said latch members can be retracted by the application of a vertical force in one direction on said arm rests.

6. Expansible furniture comprising: a first seat member having an upper surface adapted to support a person, and opposite longitudinal side faces; expansion seat members, each having an upper surface adapted to support a person, and opposite longitudinal side faces; interfitting tongue and groove means on said first seat member and said expansion seat members to slidably mount said expansion seat members on said first seat member, said interfitting tongue and groove means being arranged so that the upper surfaces of the first seat member and the expansion seat members are generally horizontally aligned; a back member; a sleeve extending transversely across said back member, and having open ends at opposite sides of said back member; a pair of arm rests, each slidably received in said sleeve and extending outwardly from one end thereof; and means for securing said arm rests at laterally adjusted positions on said back member.

7. Expansible furniture comprising: a first seat member having an upper surface adapted to support a person, and opposite longitudinal side faces; expansion seat members, each having an upper surface adapted to support a person, and opposite longitudinal side faces; interfitting tongue and groove means on said first seat member and said expansion seat members to slidably mount said expansion seat members on said first seat member, said interfitting tongue and groove means being arranged so that the upper surfaces of the first seat member and the expansion seat members are generally horizontally aligned; back structure having said seat members associated therewith; a pair of arm rests; means on said back structure for vertically slidably mounting said arm rests on said back structure; and cooperating means on said arm rests and said back structure for releasably securing said arm rests at different vertical elevations on said back structure.

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