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Brown

(54) NON LOAD-BEARING INTERIOR DEMISING WALL OR PARTITION

(76) Inventor: **Robert William Brown**, Bedford, TX (US)

Correspondence Address:
Robert W. Brown
820 Mayfair Hill Ct.
Bedford, TX 76021 (US)

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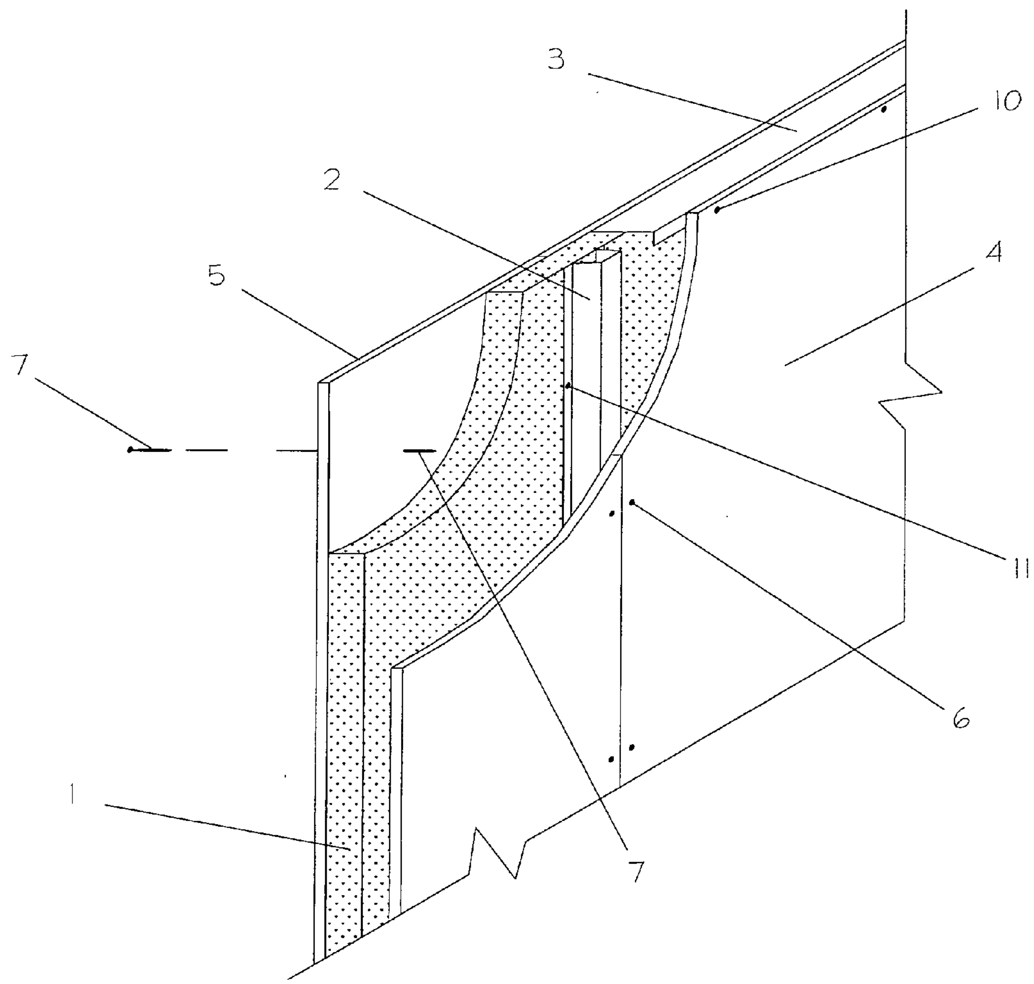
(52) **U.S. Cl.** **52/145**

(57) **ABSTRACT**

A non load-bearing interior demising wall construction comprising a plurality of CAF panels each sized to span the full wall height and placed in aligned edge to edge abutted position and a plurality of stiffening means also sized to span the full wall height. CAF panels and stiffening means slidably disposed within a top and bottom track and sized to provide a friction fit therein. A plurality of wall facing sheets sized to span the full wall height placed in edge to edge abutted position to as to provide a seamless wall face with said wall facing sheets residing outside said top and bottom tracks and attached to said stiffening means. Preferably, top and bottom track and stiffening means are comprised of readily available standard drywall materials.



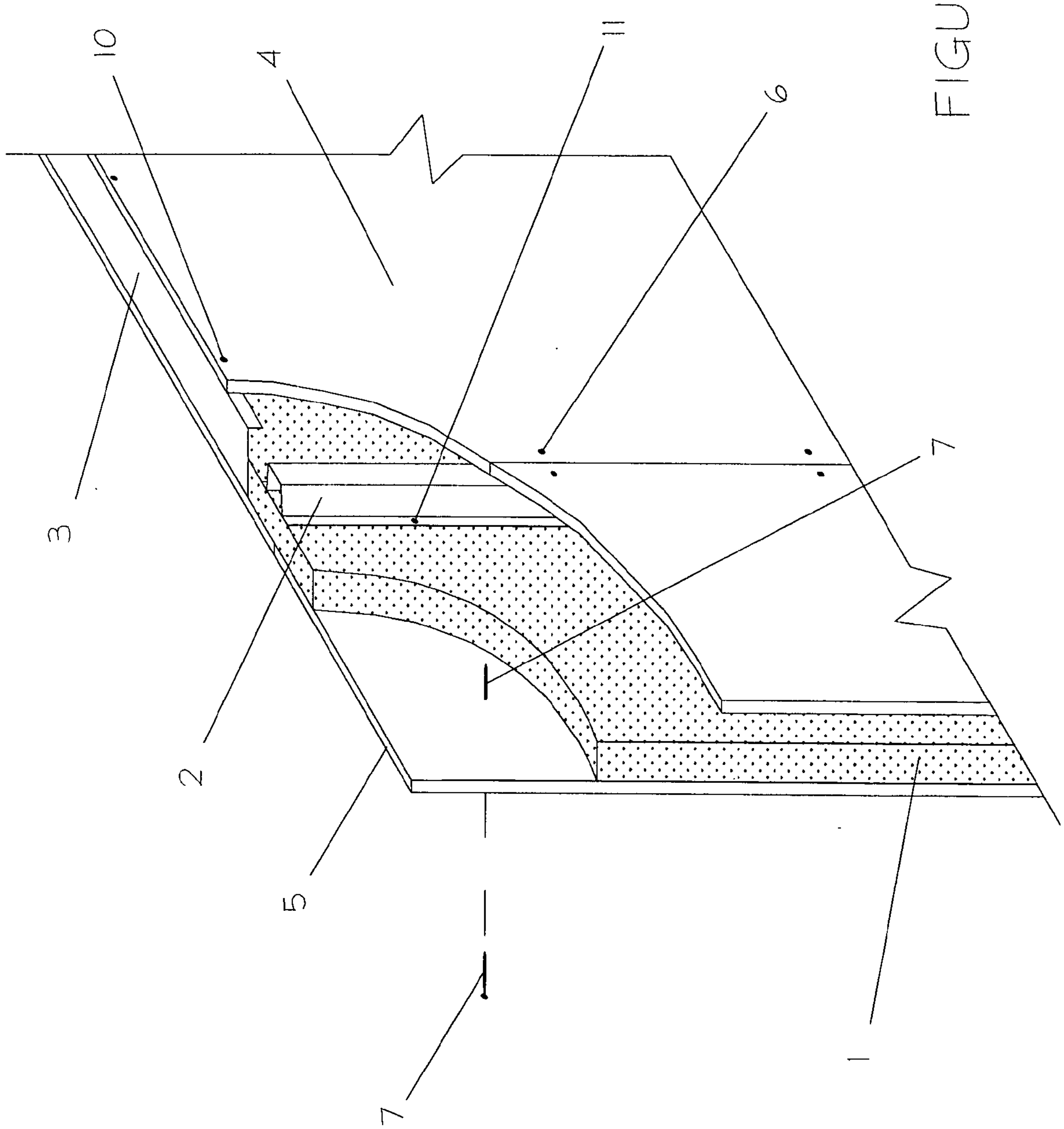


FIGURE 1

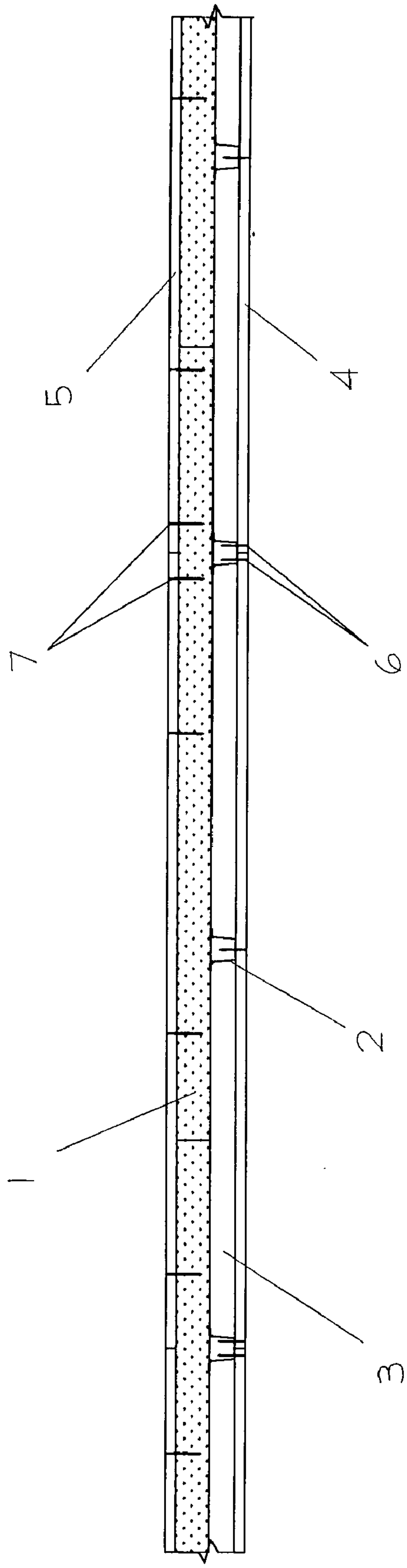
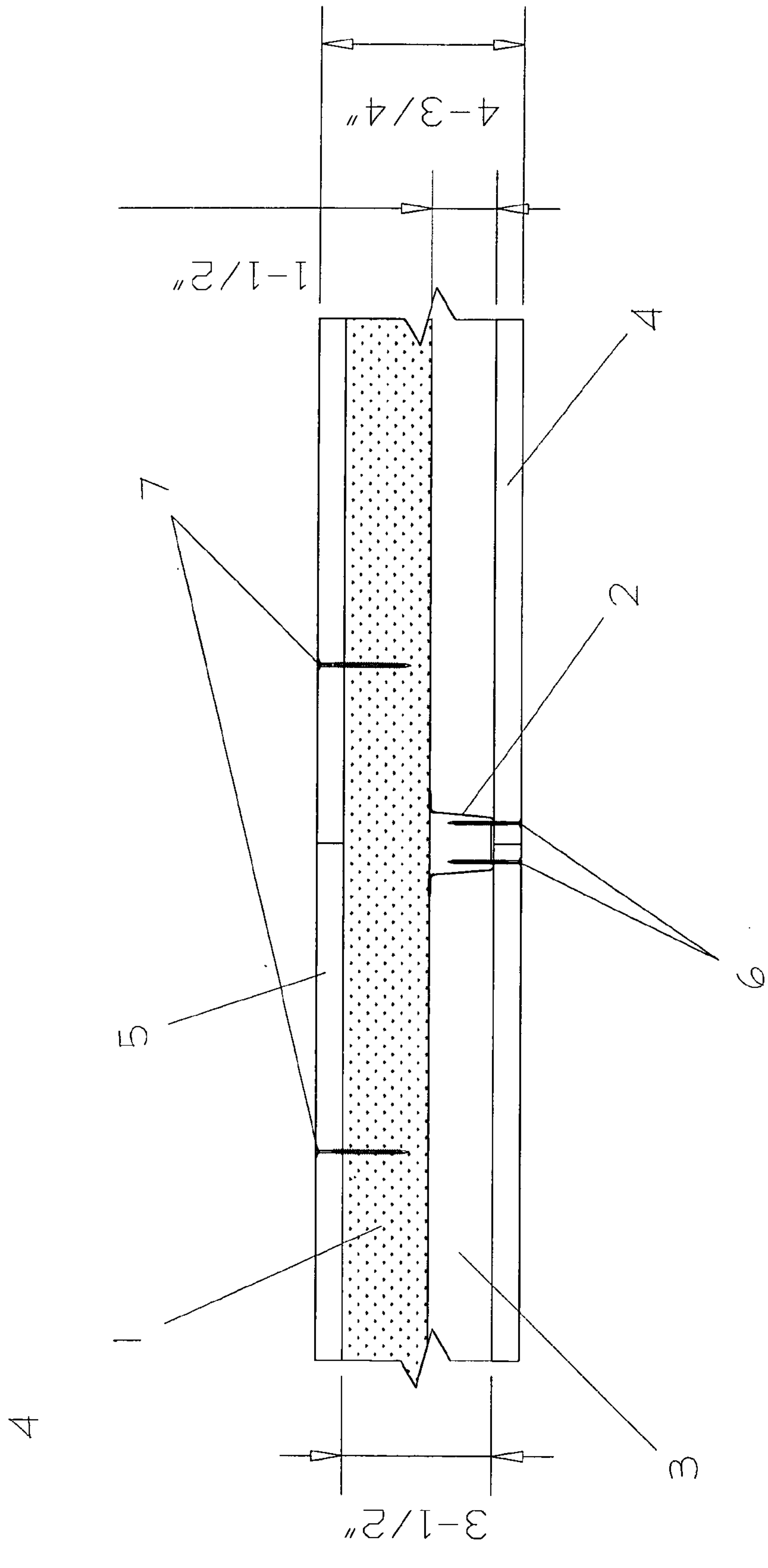


FIGURE 2



Preferred Embodiment

FIGURE 3

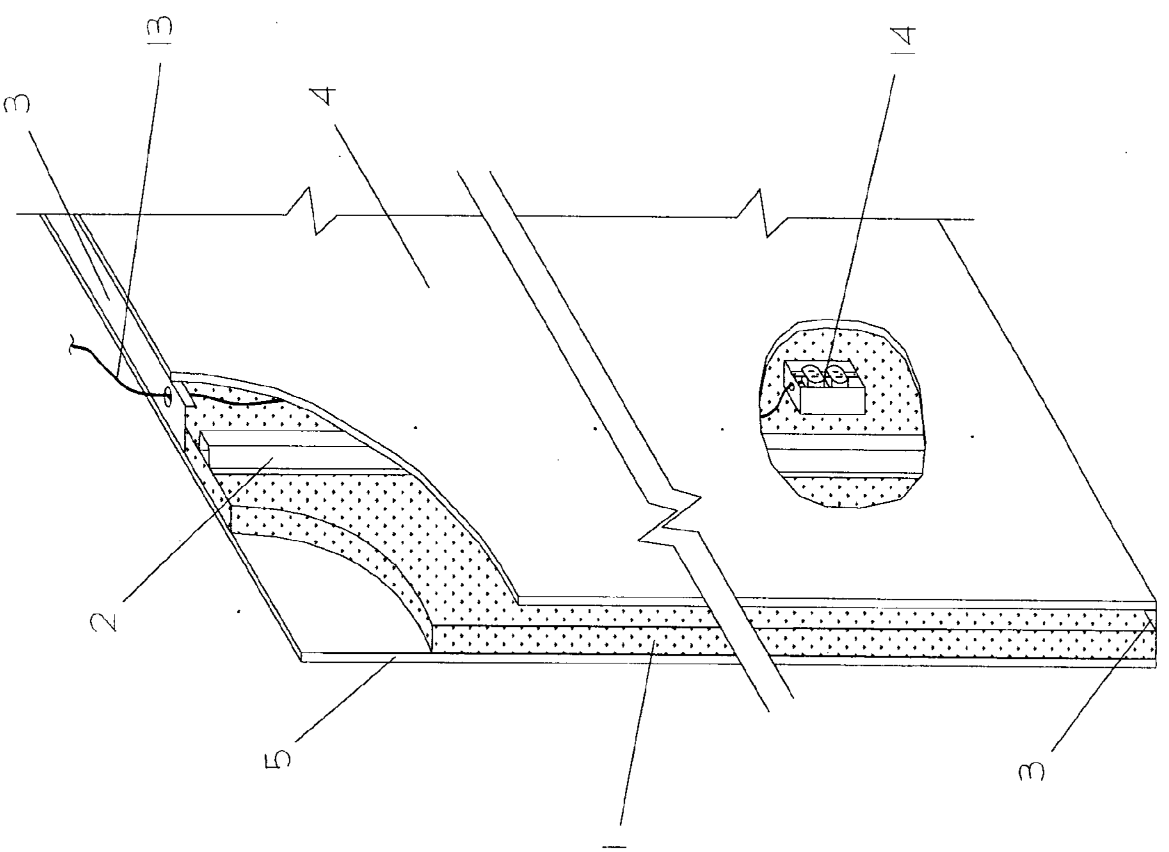


FIGURE 4

FIGURE 5a

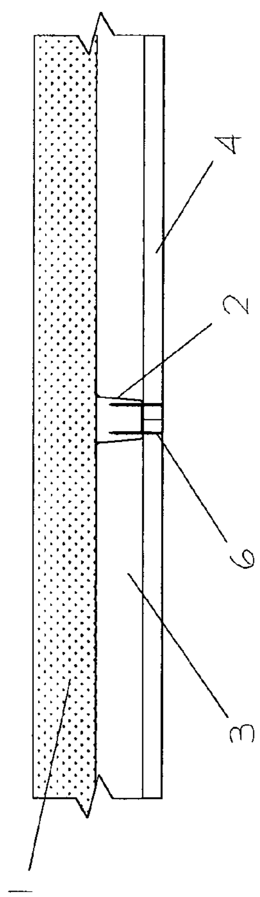


FIGURE 5b

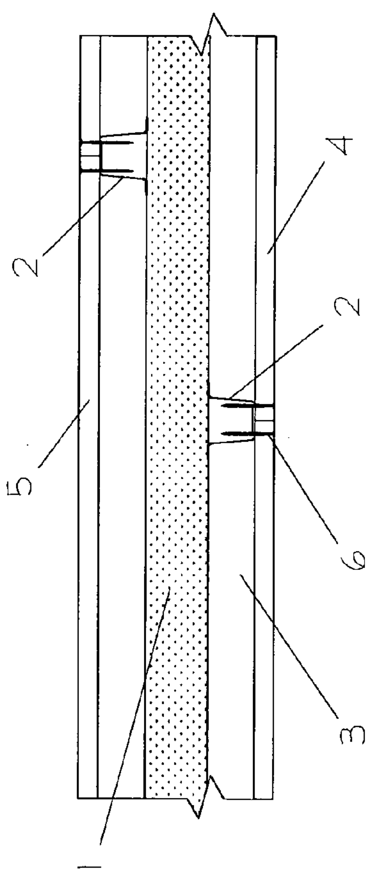
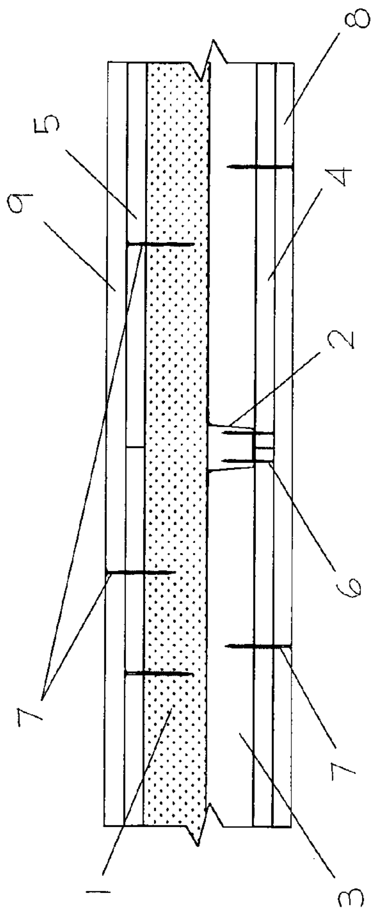
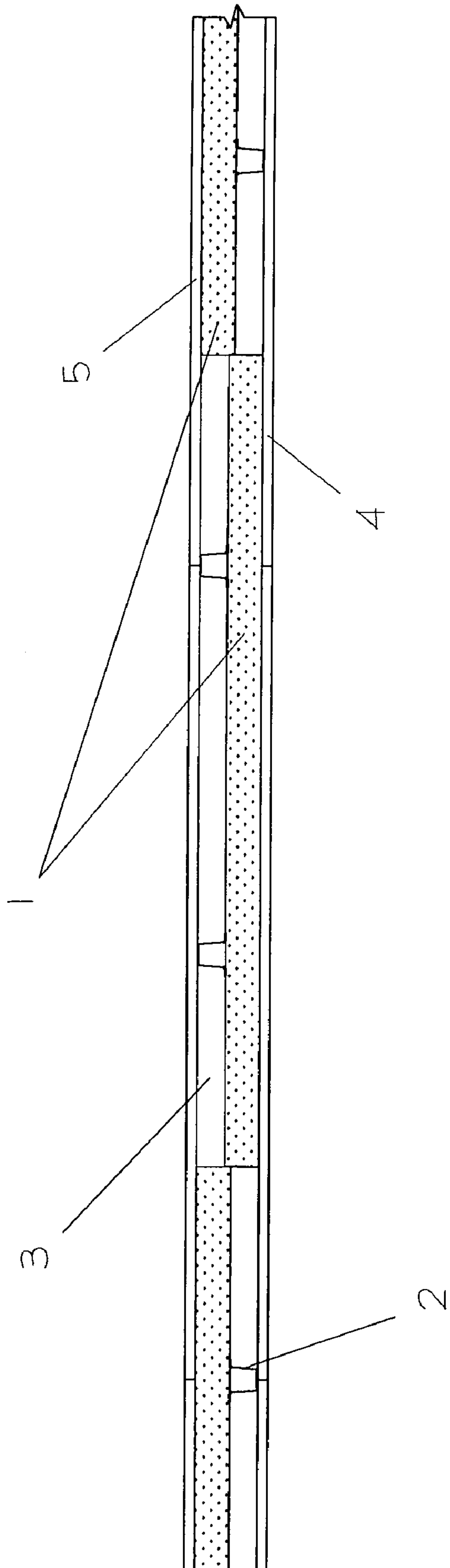


FIGURE 5c

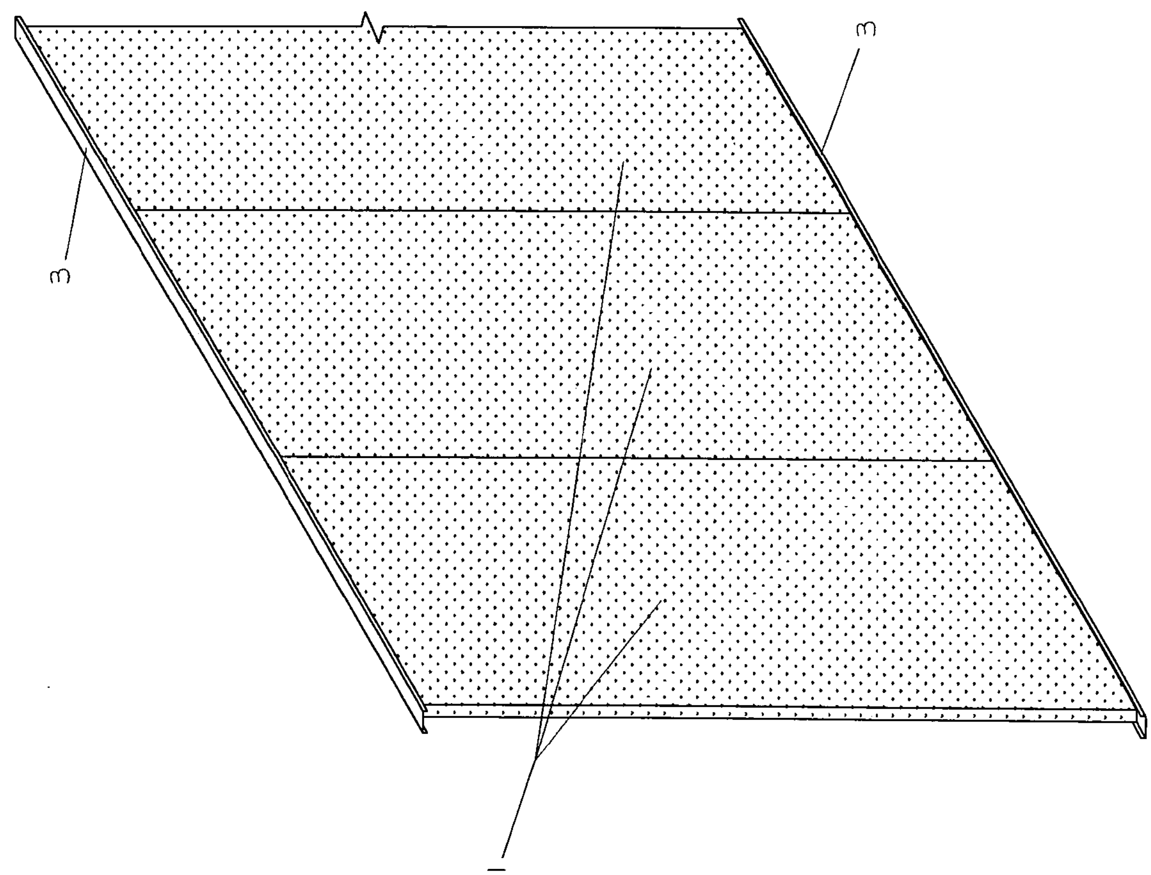




Alternate Embodiment

FIGURE 6

FIGURE 7



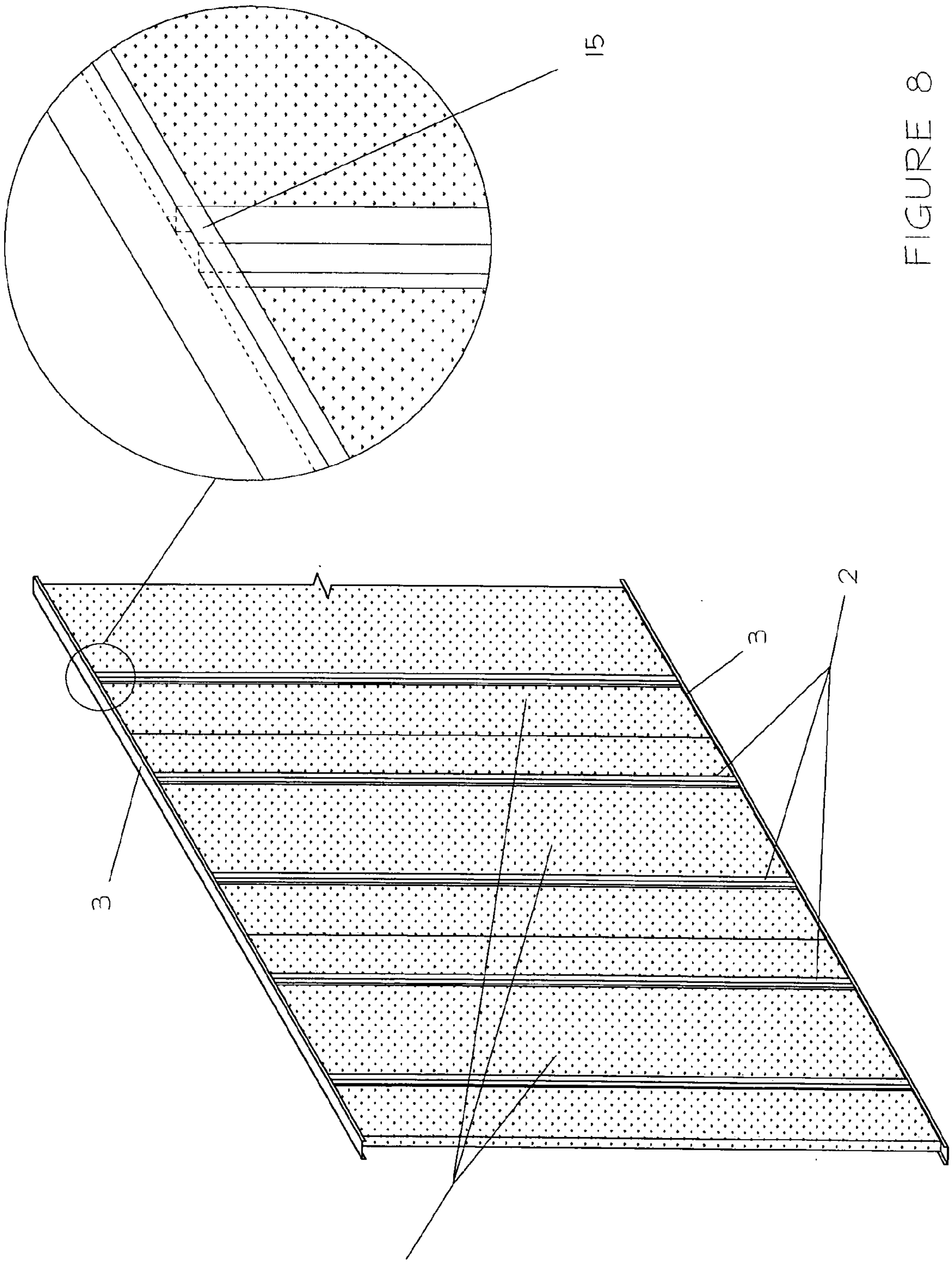


FIGURE 8

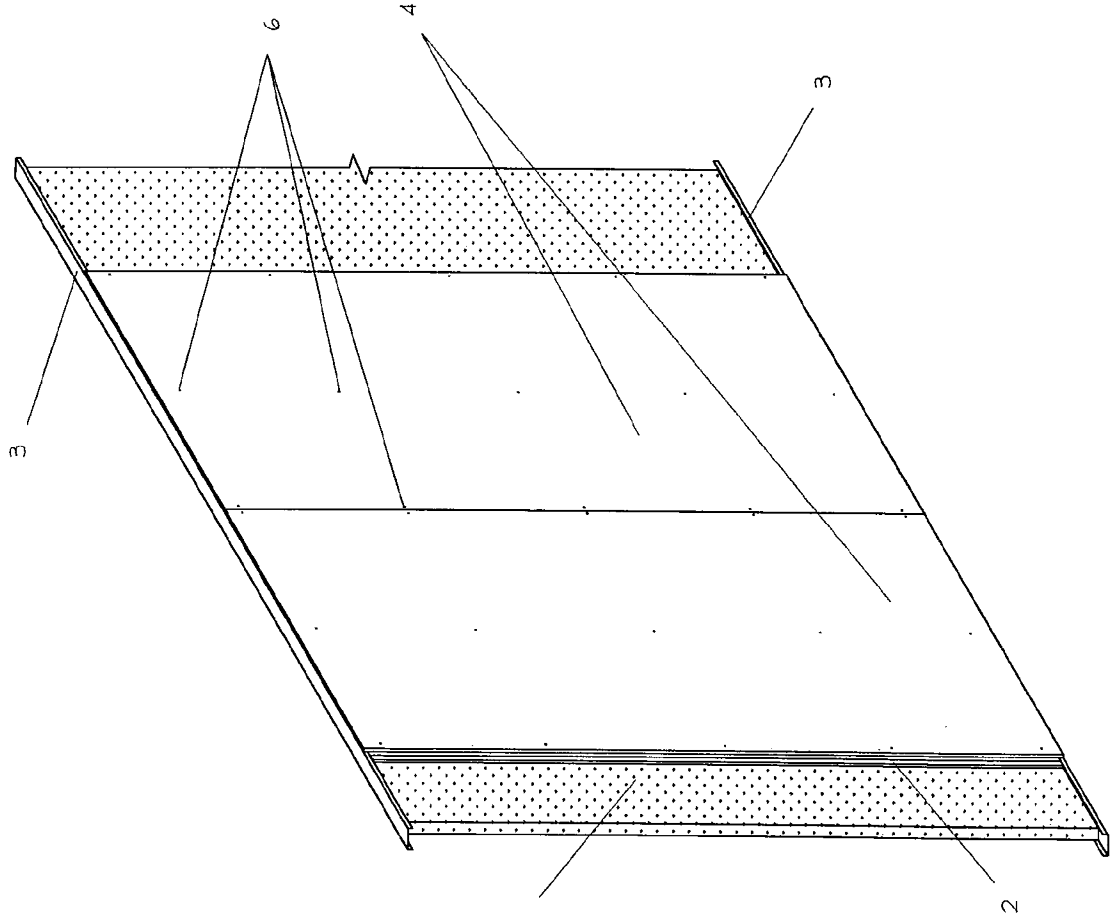


FIGURE 9

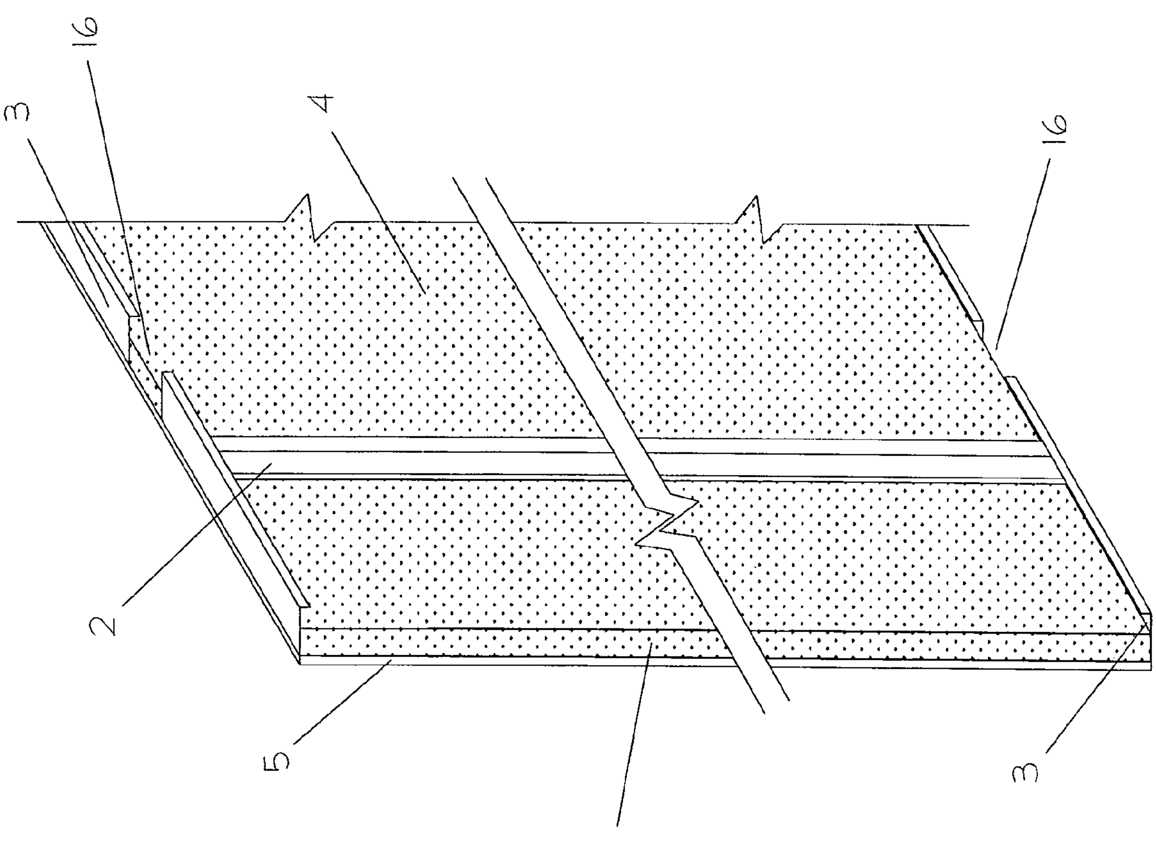


FIGURE 10

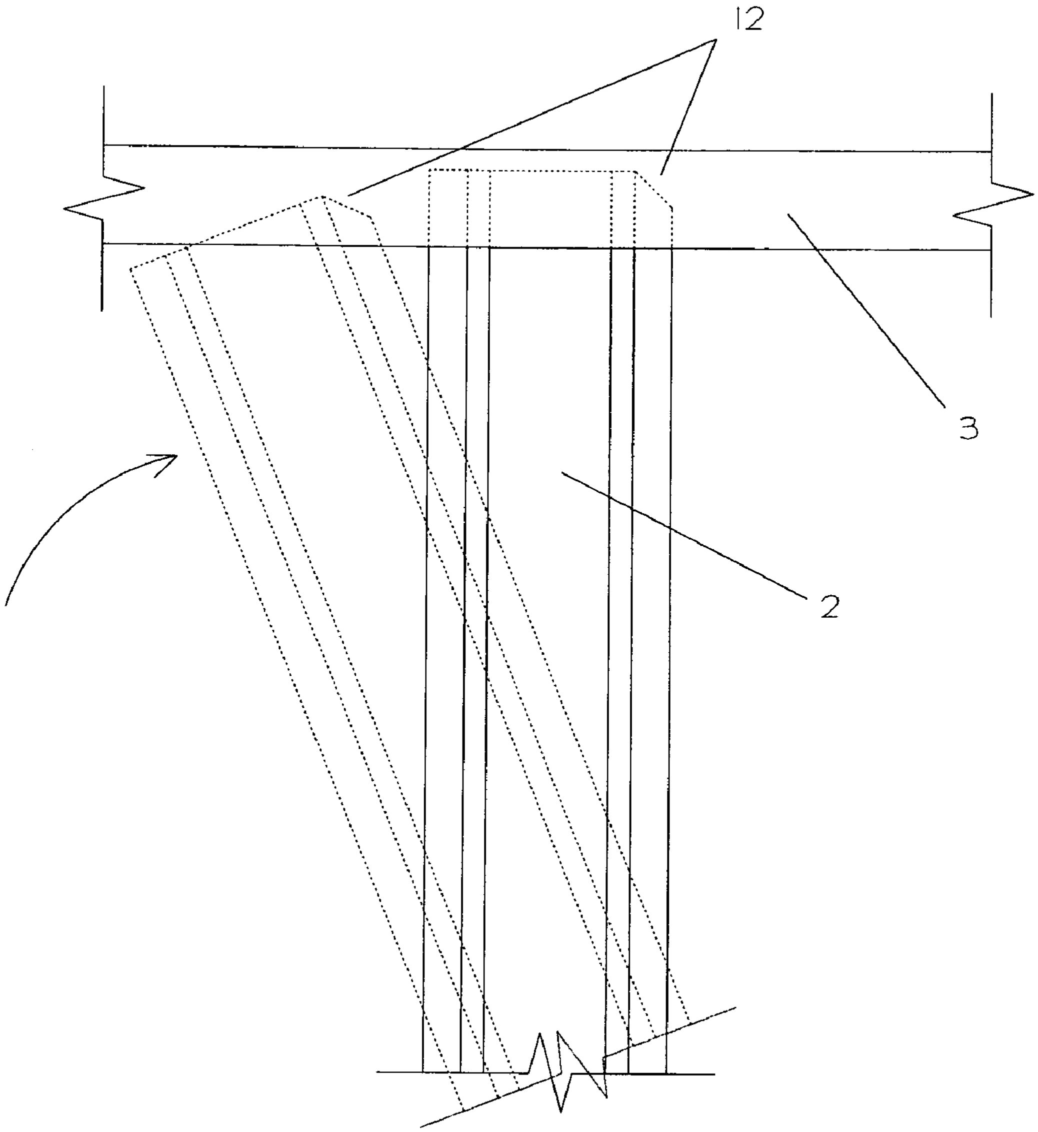


FIGURE 11

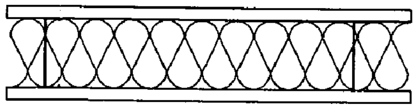


Figure 12a

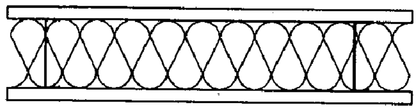


Figure 12b

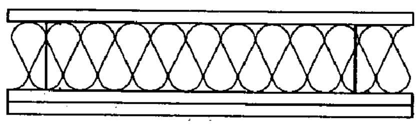


Figure 12c

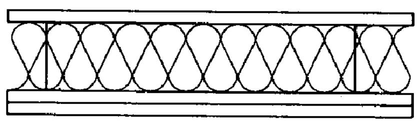


Figure 12d

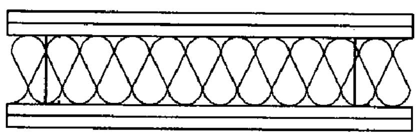


Figure 12e

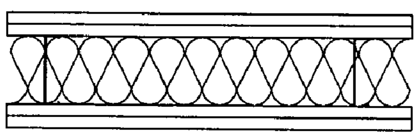


Figure 12f

Prior Art

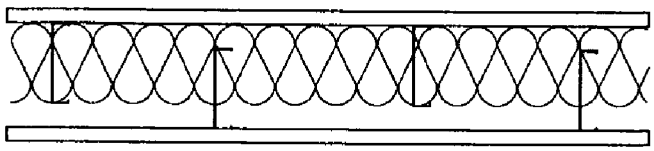


Figure 13a

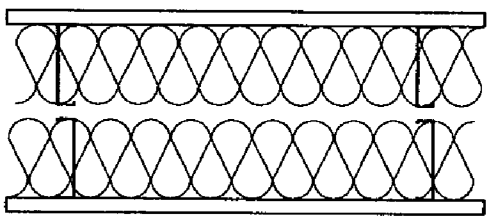


Figure 13b

Prior Art

NON LOAD-BEARING INTERIOR DEMISING WALL OR PARTITION

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] Not Applicable

FEDERALLY SPONSORED RESEARCH AND DEVELOPMENT STATEMENT

[0002] This invention was not developed in conjunction with any federally sponsored contract.

MICROFICHE APPENDIX

[0003] Not applicable.

INCORPORATION BY REFERENCE

[0004] Not applicable

BACKGROUND OF THE INVENTION

[0005] The primary function of interior walls and partitions is to divide building space into separate, private spaces. Many other factors, however, must be considered by designers and builders, one of which is sound control. In hotels, for example, the prevention of sounds originating in one room from passing through walls and into adjacent rooms is of major concern. Home media rooms have introduced a greater need for sound control into many home construction projects, and the need for sound isolation between adjacent office spaces in commercial office buildings is significant and growing.

[0006] Sound transmission through walls is typically expressed according to one of two single-number rating systems—Sound Transmission Class (STC) and Weighted Sound Reduction Index (R_w). Both are single-figure ratings schemes intended to rate the acoustical performance of a partition element under typical conditions involving office or dwelling separation; the higher the value of either rating, the better the sound attenuation. The rating is intended to correlate with subjective impressions of the sound insulation provided against the sound of speech, radio, television, music, office machines and similar sources of sound characteristic of offices and home dwellings.

[0007] The first rating system is called Sound Transmission Class (STC). STC is defined by the American Society for Testing Materials (ASTM) standard E 413. To assign an STC rating to a barrier separating two rooms, a sound is generated in one of the rooms, the sound power is measured on both sides of the barrier, and the ratio between the two measurements (the transmission loss) is stated in decibels. Sixteen measurements are made in each room, at ⅓ octave intervals from 125 Hz to 4000 Hz. A higher STC rating indicates a greater sound transmission loss through a structure. The E413 standard specifies a transmission loss curve having 16 points on the same ⅓ octave intervals. From 125 to 400 Hz, the curve slopes upward 9 dB per octave; from 400 Hz to 1250 Hz, 3 dB per octave, and it is flat from 1250 Hz to 4000 Hz. The curve is moved up and down until the sum of all 16 differences between the curve's value and the measured values for the barrier is less than 32 dB (providing no single difference is more than 8 dB). The rating is then expressed as the curve's loss in decibels at 500 Hz.

[0008] The second rating system is called Weighted Sound Reduction Index (R_w) and is defined by International Standards Organization standard ISO 717. Test procedure for R_w are similar to STC except the frequency range for R_w spans 100-3150 Hz whereas, as indicated supra, STC covers a frequency range of 125-4000 Hz. STC and R_w correlate very well. For architectural elements such as doors, windows and walls, differences in STC and R_w are typically less than 1%.

[0009] When sound waves strike a surface, some of the energy is usually reflected while some is transmitted through the surface. A typical objective in reducing sound transmission through a structure is to isolate the source from the structure before the energy can be transmitted to the structure, causing the structure to vibrate. The primary ways to reduce sound transmission through multi-component structures is to add mass and to decouple or isolate individual components so that vibrations cannot be passed from one component to the next.

[0010] Conventional wall construction techniques tend to rely on a stud frame interior with wall covering panels comprised of gypsum board, plywood or other largely modular panels. Interior walls in offices, hotels and the like are typically made by erecting a frame that includes vertical studs, either wood or steel, on a 12", 16" or sometimes 24" spacing, lining each side with gypsum board (sheet rock) panels, then finishing the wall surfaces with a variety of textures and paint. When additional thermal and/or acoustic insulation is needed, insulation medium such as fiberglass, rock wool or mineral wool will commonly be placed to fill the interior space between vertical studs and gypsum board panels. Sound transmission through walls is commonly reduced by adding a second layer of gypsum board to one or both sides. Sound transmission can be further reduced by widening the wall and staggering the studs such that no stud spans the full width of the wall. Sound transmission through a wall can be slightly reduced by surface or exterior treatments such as the application of light, resilient materials like carpeting, folded or layered upholstery, or the like, but these measures are usually done to affect reverberation within a room not attenuation through a wall.

[0011] Decoupling can be done in many ways and is the subject of much development. Typically, decoupling is done by means of soft, resilient and/or generally bulky materials. Isolated or still air is an effective decoupler and there are many applications wherein the insulation of sound and heat are accomplished analogously. Decoupling can be enhanced by the use of viscoelastic materials, typically high molecular weight polymers, to isolate components and reduce contact between larger or more rigid components. The viscoelastic materials, in effect, allow the larger and/or more rigid components to vibrate independently and, more importantly, act to dampen the vibration of the components.

[0012] Viscoelastic materials, as the name implies, exhibit both elastic and viscous properties and are generally modeled using a combination of springs and dashpots. Springs simulate elastic behavior while dashpots simulate viscous behavior. When a viscoelastic material is made to vibrate, a complex strain is generated on the material thereby generating a complex stress. The elastic modulus (E) is known to be the ratio of stress (σ) and strain (ϵ) in a material and can be described as the amount of strain resulting from an applied stress ($E=\sigma/\epsilon$). In a viscoelastic material, the elastic modulus is comprised of two components, a storage elastic modulus (E_S) which results from the elastic properties of the material, and a loss elastic modulus (E_L) resulting from the viscous properties of the material. The ratio of loss modulus to storage modulus is called loss tangent (tan δ) and is the mathematic ratio between the two ($\tan \delta = E_L/E_S$). The loss modulus component corresponds to a materials ability to convert dynamic energy to electric or thermal energy, thus an ability to dampen vibrations. It follows that as a materials tan δ increases, so does that materials ability to dampen vibrations.

[0013] Decoupling can also be achieved by means of resilient channel members used as part of a wall construction. Resilient channels, typically transversely mounted, act to absorb vibrational energy instead of transmitting the energy from one wall component to the next. Historically, however, less than optimum construction and installation practices often lead to acoustic short circuits around or across resilient channels essentially negating their full effect.

[0014] Another technology often employed is the use of panels comprised of a honeycomb core. In some cases, the cells of the honeycomb core effectively trap dead air which is a relatively poor acoustic conductor. In more sophisticated applications, the individual honeycomb cells may be designed as interconnected Helmholtz resonators which dissipate acoustic energy by allowing the viscous laminar flow of air between resonators.

[0015] It is known that sound insulation is best obtained from multi-shell components wherein both the mass and the resiliency of the components are factors, thus a best combination of weight and bulk is typically sought. New materials, namely novel viscoelastic polymers included as part of layered panels are finding use in high STC wall construction, but these constructions tend to be expensive and remain largely unproven.

[0016] All of the knowledge of the benefits of decoupling whether by means of viscoelastic materials, resilient channel members, honeycomb core materials, or other novel approaches not withstanding, most interior demising walls remain the simple wall structures described above; spaced studs (wood or steel) with one or more layers of drywall on each face, and maybe an insulation material filling the walls interior cavities. The reasons for this are both functional and economic; viscoelastic materials, resilient channels, and other technologies are expensive, hard to effectively construct and install in the field, or both. For example, resilient channels can be and are commonly rendered ineffective by simple means of misplaced screws that create bridging across the channel and eliminate the decoupling effect that the resilient channel would otherwise provide.

[0017] Compressed agricultural fiber (CAF) panels were invented and developed in Sweden in 1933 and first commercialized by the Stramit Company shortly thereafter. CAF panels produced today are similar to those first developed by Stramit and are basically comprised of two components; a highly compressed straw core, and a paper or paperboard exterior liner. The panels are produced by means of a dry extrusion process wherein dry straw is forced through a heated dye by a heavy reciprocating ram. The dye is essentially a series of two pair of top and bottom platens which are spaced at a distance that defines the panel thickness. The elongated platens are heated to approximately 400° F. A top and bottom paperboard liner is coated on one side with adhesive, and then fed through the second pair of platens such that paper board covers the entire outer surface of the straw core as the board exits the second pair of platens.

[0018] CAF panels differ from other cellulose fiber-based panels (particle board, OSB, etc.) in that CAF panels contain no glues or resins to bond the internal fibers together. CAF panels only contain enough glue to bond an exterior paper liner to the compressed straw core, and that glue is typically a non-toxic, water-based polyvinyl acetate glue that generates virtually no VOC's, thus the formaldehyde issues and off gassing associated with so many wood or other cellulose-based panels and/or building products simply do not exist with CAF panels.

[0019] CAF panels can currently be manufactured to any thickness between 1½" and 3½", and are most commonly made in a 2" or 2¼" thickness. Thinner CAF are currently under development. Densities vary slightly among manufacturers, but will commonly fall within the range of 1.6-2.1 pounds/square foot/inch of thickness. R values and sound attenuation (STC) properties vary with density. R values commonly within the range of 1.8-2.0/inch of thickness, whereas STC for a common 2" thick panel will fall within the range of 30-34. CAF panels are very effective at sound attenuation, i.e., preventing acoustic energy from passing through the material. Though yet unproven, there is considerable belief that the exceptional sound attenuation properties of CAF panels is due to some degree of viscoelastic behavior as CAF panels tend to attenuate acoustic energy at a higher level than their mass would inherently allow.

[0020] Though having existed since the 1930's, CAF panels are just beginning to find sustainable markets in the U.S. The rapidly growing interest now seen within the U.S. and new markets that are developing as a result of this interest is due in large part to the environmental-related properties of CAF panels. More specifically, CAF panels are made primarily from rapidly renewable sources (wheat straw, rice straw, and the like), require relatively little energy to manufacture, are readily recycled or easily disposed of, and contain only environmentally benign components. As mentioned supra, CAF panels contain virtually no VOC's and generate virtually no off-gassing. Conservative calculations indicate that on a per unit weight basis, the amount of energy required to manufacture gypsum board is over **24** times higher than that required to manufacture CAF panels. Consequently, CAF panels garner generous points for projects seeking US Green Building Council LEED certification. The growing interest in LEED is primary to the growing domestic markets for CAF panels.

[0021] In modern office buildings, business and conference centers, hotels, classrooms, medical facilities, and the like, the fitting-out of occupiable space is continuously becoming more important and ever more challenging. In the competitive business environment, cost concerns alone dictate the efficient use of interior space. Thus, the finishing or fitting-out of building spaces for offices and other areas where work is conducted has become a very important aspect of effective space planning and layout.

[0022] Business organizations are constantly changing as are their work patterns and the technology utilized therein. Building space users require products that provide for change at minimal cost. At the same time, their need for functional interior accommodations remains steadfast. Issues of privacy, functionality, aesthetics, acoustics, etc., are unwavering. For architects and designers, space planning for both the short and long term is a dynamic and increasingly challenging problem.

Changing work processes and the technology required demand that designs and installation be able to support and anticipate change.

[0023] The cost efficient use of building floor space is also an ever-growing concern, particularly as building costs continue to escalate. Open office plans that reduce overall office costs are commonplace, and generally incorporate large, open floor spaces. These spaces are often equipped with modular furniture systems that are readily reconfigurable to accommodate the ever changing needs of specific users, as well as the divergent requirements of different tenants. However, for privacy, productivity, or other reasons, interior walls and/or partitions are still required although the functionality requirement of interior walls is changing.

[0024] As mentioned supra, office walls and/or partitions are typically made by erecting a wood or steel stud frame comprising vertical studs spaced on a regular interval, lining each side with gypsum board (sheet rock) panels, then finishing the wall surfaces with a variety of textures and paint. When additional thermal and/or acoustic insulation is needed, insulation medium such as fiberglass, rock wool, mineral wool or cellulose will commonly be placed to fill the interior space between vertical studs and gypsum board panels. These conventional walls have proven sturdy, provide adequate superior privacy and sound proofing, and provide a surface that easily accepts wall hangings such as pictures, paintings, plaques and the like. Furthermore, as is commonly known, conventional walls can easily be repainted, retextured, and, readily patched and repaired when damaged. Conventional gypsum board partitions are typically custom built floor-to-ceiling installations that, due primarily to the fixed vertical studs, are time-consuming to erect and build.

[0025] As previously stated, interior walls in offices, hotels and the like are typically made by erecting a frame that includes vertical studs, either wood or steel, on a 12", 16" or 24" spacing, lining each side with gypsum board (sheet rock) panels, then finishing the wall surfaces with a variety of textures and paint. FIGS. **12***a*-**12***f* illustrate a cross-sectional plan view of conventional interior partition constructions.

[0026] FIG. **12***a* shows a nominal 3½" steel stud framed wall with one layer of ½" gypsum board on each face and 3½" of fiberglass batt/fill in the interior. This wall provides an STC 39 as per NRC-CNRC Report IRC-IR-761, wall no. 25. Replacing the 3½" steel studs in this wall with nominal wood 2×4 studs reduces the STC to 32.

[0027] FIG. **12***b* shows a nominal 3½" steel stud framed wall with one layer of ⅝" gypsum board on each face and 3¼" of mineral wool batt/fill in the interior. This wall provides an STC 39 as per NRC-CNRC Report IRC-IR-761, wall no. 63. Replacing the 3½" steel studs in this wall with nominal wood 2×4 studs reduces the STC to 34.

[0028] FIG. **12***c* shows a nominal 3½" steel stud framed wall with one layer of ½" gypsum board on one face, two layers of ½" gypsum board on the other face, and 3½" of fiberglass batt/fill in the interior. This wall provides an STC 44 as per NRC-CNRC Report IRC-IR-761; wall no. 84. Replacing the 3½" steel studs in this wall with nominal wood 2×4 studs and replacing the fiberglass with a comparable thickness of cellulose fill reduces the STC to 37.

[0029] FIG. **12***d* shows a nominal 3½" steel stud framed wall with one layer of ⅝" gypsum board on one face, two layers of ⅝" gypsum board on the other face, and 3¼" of mineral wool batt/fill in the interior. This wall provides an STC 46 as per NRC-CNRC Report IRC-IR-761, wall no. 99.

[0030] FIG. **12***e* shows a nominal 3½" steel stud framed wall with two layers of ½" gypsum board on each face and 3½" of fiberglass batt/fill in the interior. This wall provides an STC 52 as per NRC-CNRC Report IRC-IR-761, wall no. 111.

[0031] FIG. **12***f* shows a nominal 3½" steel stud framed wall with two layers of ⅝" gypsum board on each face and 3" of mineral wool batt/fill in the interior. This wall provides an STC 52 as per NRC-CNRC Report IRC-IR-761, wall no. 129.

[0032] A large number of variations of the basic conventional stud-frame wall constructions illustrated in FIGS. **12***a*-**12***f* exist. Most variations made in order to improve acoustic attenuation involve stud configurations intended to decouple the two opposed wall faces. Most variations involve either a staggered stud within a common frame or two separate frames, closely spaced, but fully decoupled. These common options are illustrated in FIGS. **13***a* and **13***b*.

[0033] In addition to variations of conventional wall constructions illustrated in FIGS. **12***a*-**12***f*, **13***a*, **13***b* and those discussed above, there exist enhanced gypsum wallboard materials that include viscoelastic materials and/or other sound attenuation enhancing components. The enhanced gypsum wallboards are commonly used in a conventional manner as a simple replacement for conventional gypsum wallboard.

[0034] Still further, there exist countless demountable and/or moveable interior partition systems of varying degrees of complexity and costs. Two characteristics are consistent within the art and within these various partition systems: they are more expensive than the conventional wall constructions illustrated in FIGS. **12** and **13** and/or they fail to meet the environmental properties required to meet LEED certification standards.

[0035] Additionally, CAF panels can and have been used in several wall configurations ranging from conventional stud walls wherein commonly used gypsum wallboard (sheet rock) is essentially replaced with CAF panels to simple studless walls comprised only of CAF panels held in place at the top and bottom, typically by a simple channel. Each of these constructions has substantial limitations that have precluded any commercial success. Simply using CAF panels in lieu of gypsum wallboard is costly and time consuming; one must build a conventional wood or steel stud frame, mount to CAF panels to the stud frame, and then cut openings for utilities and the like. Further, this method results in a wall that is much thicker than conventional drywall walls, thus incompatible with standard doors, windows, etc., without substantial modifications. On the other hand, simple interior partitions comprised of only a single plane of CAF panels lack the needed stiffness, are generally incompatible with conventional doors, windows and other hardware, and do not meet most codes without running utilities (wiring, plumbing, etc.) exposed on the surface; clearly an unacceptable practice. Even the simplest of configurations—using a single plane of CAF panels wherein no utilities are required—results in a wall that lacks stiffness, regardless of panel thickness. Among other problems, any texturing and/or paint on the wall surfaces tends to crack when the relatively flimsy walls are displaced by human contact, or more likely, by internal changes in static pressure.

[0036] Needed in the art is an interior wall and/or partition construction that effectively exploits the unique and favorable physical and acoustic properties of CAF panels yet overcomes the particular physical limitations normally encountered. Further, what is needed in the art is an interior wall and/or partition construction that is quicker and more cost effective to initially install than conventional wall constructions, and quicker and more cost effective to move and/or relocate; essentially being demountable. Still further, what is needed in the art is an interior wall construction method that provides the sturdiness, look and feel, and general dimensions of conventional walls and/or partitions while providing quicker and easier reconfigurability and improved acoustic attenuation for growing privacy needs. Finally, what is increasingly needed in the art is an interior wall and/or partition system with the requisite environmental properties to meet the requirements of the U.S. Green Building Council's LEED criteria. The invention disclosed herein meets these needs, and represents a significant improvement over existing art.

SUMMARY OF THE INVENTION

[0037] The present invention relates to interior wall constructions, more particularly to interior wall constructions comprised of compressed agricultural fiber (CAF) panels. Further, the present invention relates to interior wall constructions comprising CAF panels and stiffener channels held in place by a top and bottom track and further comprising front wall facing comprised of sheets placed along the front wall face in edge to edge abutted relative position and with each facing sheets attached to one or more stiffener channels. CAF panels, stiffeners and wall facing sheets all sized to span to full vertical height of the wall. Preferably, the top and bottom track and stiffener channel elements all comprise standard drywall materials. Optionally, rear wall facing sheets, also placed in edge to edge abutted relation and sized to span the full vertical wall height are placed along the rear wall face and attached to the CAF panels.

BRIEF DESCRIPTION OF THE DRAWINGS

[0038] FIG. **1** includes a general perspective view of the preferred embodiment of subject demising partition.

[0039] FIG. **2** shows a plan view of the preferred embodiment of subject demising partition.

[0040] FIG. **3** shows a detailed plan view of the preferred embodiment of FIG. **2** including specific dimensions.

[0041] FIG. **4** shows a perspective view of the preferred embodiment of FIG. **1** including an illustration of utilities.

[0042] FIG. **5** shows plan views of three (**5***a*-**5***c*) alternative embodiments of subject demising partition.

[0043] FIG. **6** shows a plan view of another alternative embodiment of subject partition.

[0044] FIGS. **7** thru **9** illustrate the stepwise construction of the subject demising partition.

[0045] FIG. **10** provides a perspective view of an alternative embodiment of a key element.

[0046] FIG. **11** provides an elevation view of an alternative embodiment of a key element.

[0047] FIG. **12** (**12***a*-**12***f*) as discussed above, provides plan view of conventional demising wall constructions.

[0048] FIG. **13** (**13***a* & **13***b*) provides a plan view of two conventional demising walls for improved acoustic attenuation.

DETAILED DESCRIPTION OF THE INVENTION

[0049] FIG. **1** provides a general perspective view of the preferred embodiment of subject partition. The basic elements are comprised of a top and bottom track (**3**), placed along the top and bottom of a wall line and anchored to the floor and roof deck or ceiling by means of conventional drywall track anchoring methods. Bottom track (**3**) is not shown in FIG. **1**. The size and weight/gauge of said top and bottom track can be varied, but importantly, can be standard drywall track such as common 3½" or 3⅝" track in standard 22GA or 25GA weights. Standard drywall track is readily available and generally inexpensive thus contributing to the cost effectiveness of subject partition. Further comprising the basic elements are a plurality of CAF panels (**1**) inserted between top and bottom tracks (**3**) and sized such that the vertical height of each panel (**1**) generally matches the distance between top and bottom tracks (**3**). Each panel (**1**) can be cut to size in the field, but factory pre-cutting/pre-sizing is preferred in order to reduce installation time. Said panels (**1**) are arranged in close edge to edge abutted relation such as to create a continuous planar wall.

[0050] Still further comprising the basic elements are a plurality of vertical stiffening channels (**2**) also inserted between top and bottom tracks (**3**) in generally vertical alignment and evenly spaced laterally. In the preferred embodiments, stiffening channels (**2**) will be evenly spaced at 12", 16" or 24" intervals. The width of top and bottom track (**3**), thickness of panels (**1**) and dimensions of stiffening channels (**2**) will each be sized to provide a snug friction fit such that panel (**1**) and stiffening channel (**2**) are held firmly within said track (**3**). In the preferred embodiment, this snug, friction fit is accomplished using standard, off-the-shelf, readily available drywall materials and CAF panels. Also in the preferred embodiment, said stiffening channel is a standard 2½"×1½" drywall furring channel, either 20GA-25GA, depending upon wall stiffness needs. Stiffening channels (**2**) are an essential element as CAF panels alone do not provide adequate stiffness without supplementation.

[0051] Further comprising the basic elements are a plurality of front wall facing sheets (**4**) each sized to span the entire distance from floor to ceiling/roof deck thus generally matching the vertical distance between tracks (**3**) and placed in general edge to edge abutted relationship so as to form a continuous wall facing. Said front facing sheets are connected by means of a plurality of penetrating connectors (**6**) placed through the facing sheet and each terminating within an underlying stiffening channel (**2**). In the preferred embodiment, front facing sheets are ⅝" type-X gypsum wallboard, and penetrating connectors (**6**) are standard 1½" #7 drywall screws or equal.

[0052] Finally comprising the basic elements are a plurality of back cladding sheets (**5**), generally sized and arranged in edge to edge abutted relation, much like the front facing sheets but on the opposite side and facing the opposite direction. Further, back cladding sheets (**5**) are placed against said CAF panels (**1**) and attached thereto using a plurality of penetrating connectors (**7**), each penetrating through a back cladding sheet (**5**) and terminating within a CAF panel (**1**). In the preferred embodiment, said back cladding sheets are each ⅝" type-X gypsum wallboard, and penetrating connectors (**7**) are standard 2"#7 drywall screws or core board screws.

[0053] Optional elements include stiffening channel penetrating connector (**11**) use to secure each stiffening channel (**2**) to a CAF panel (**1**) and front facing sheet edge connectors (**10**). Both elements (**10 and 11**) are preferably standard 1½" #7 drywall screws.

[0054] FIG. **2** shows a plan view of the preferred embodiment and a better illustration of the aligned and abutted respective relationship between like CAF panels (**1**), like front facing sheets (**4**), and like rear cladding sheets (**5**) and clearly shows penetrating connectors (**6**) each terminating within a stiffening channel (**2**) and penetrating connectors (**7**) each penetrating through a back cladding sheet (**5**) and terminating within a panel (**1**). FIG. **2** also shows the even lateral spacing between adjacent stiffening channels (**2**). As mentioned supra, lateral spacing between stiffening channels is variable and can be tailored by specific application, but it should be apparent the necessary correlation between the lateral spacing of stiffening channels (**2**) and the width of front facing sheets (**4**) so that the vertical joint line where two adjacent front facing sheets meet will always align with a stiffening channel (**2**).

[0055] FIG. **3** provides a detailed illustration of the preferred embodiment including dimensions. This detail is provided to illustrate that in the preferred embodiment, the subject partition utilizes standard, off-the-shelf, materials that are cost effective, easily obtained and in good supply. As mentioned supra, in the preferred embodiment, top and bottom track (**3**) are standard 3½" drywall channel, 20Ga-25Ga. CAF panel (**1**) is a standard 2" thick strawboard panel normally available in 32" or 48" widths, either of which is compatible with the preferred embodiment. Stiffening channel (**2**) is a standard 2½"×1½" drywall furring channel, 20Ga-25Ga. Both front wall facing sheets and back cladding sheets are standard ⅝" type-X gypsum wallboard, normally available in 48" wide sheets. Both penetrating connectors (**6** and **7**) are standard #7 drywall screws, 1½" and 2" respectively. Screw length and size can be varied.

[0056] In the preferred or alternative embodiments, front wall facing and rear cladding sheets can be finished any number of ways, both conventional and non-conventional. Wall treatments such as painting, texturing, wall papering, etc., generally do not significantly effect acoustic attenuation or other physical properties, thus wall treatments are beyond the scope of this invention.

[0057] The steps required to construct subject partition are illustrated in FIGS. **8** and **9**. FIG. **8** includes the first two steps: first, a top and bottom track (**3**) are laid out along the wall centerline, the bottom track attached to the floor and top track attached to the roof deck or ceiling, depending upon the structure; second, CAF panels (**1**) are inserted between the top and bottom tracks (**3**) and then slid into proper adjacent position. Preferably, CAF panels (**1**) are factory pre-cut to match the vertical distance between tracks (**3**) such that a snug fit exists between each panel (**1**) and track (**3**) while still allowing for each panel to slide laterally for proper positioning. As a series of top and bottom tracks (**3**) are installed, one end must be left open in order to introduce panels (**2**) therebetween.

[0058] Each panel (**1**) is positioned against to back lip of top and bottom tracks (**3**) to provide room within the spaced tracks to accept a plurality of stiffening channels (**2**). Stiffening channels (**2**) can be sized to match the vertical distance between channels (**3**) wherein each channel (**2**) must be inserted at the end of the tracks, then laterally slid into position.

[0059] FIG. **10** shows and alternative embodiment wherein consecutive pieces of top and bottom track (**3**) are installed such that a gap (**16**) exists between pieces. Said gap (**16**) should be slightly wider that the over width of stiffening channel (**2**) such that individual stiffening channels (**2**) may be inserted through gap (**16**) pushed flush against panel (**1**) then moved laterally into proper position. In the preferred embodiment, stiffening channels (**2**) are comprised of standard 2½"×1½" drywall furring channels, thus if these are used, said gap (**16**) should preferably be approximately 2¾" to 3" wide.

[0060] A second alternative is illustrated in FIG. **11** which shows stiffening channels (**2**) sized slightly shorter than the panels (**3**) and clipped or tapered along one corner of each end (**12**), allowing for each channel to be turned slightly off vertical, inserted between top and bottom channels (**3**), then returned to vertical. Stiffening channels are generally evenly spaced, normally at 12", 16" or 24" on centers, but actual spacing is easily adjusted to accommodate specific needs and/or requirements.

[0061] In all cases, top and bottom tracks (**3**), panels (**1**) and stiffening channels (**2**) are sized so that the internal width of each track (**3**) will accept the thickness of one panel (**1**) and one stiffening channel (**2**) such that a snug friction fit (**15**) exists between each element thereby allowing stiffening channels to be laterally moved by means of a firm hand, tapping with a rubber mallet, or comparable non-destructive application of force. Snug friction fit is illustrated and noted on FIG. **8**.

[0062] FIG. **9** illustrates the final basic steps required to erect and/or assemble subject partition wherein front wall facing sheets (**4**) are positioned against stiffening channels (**2**) and top and bottom tracks (**3**) to create a front wall face. Said wall facing sheets (**4**) are positioned such that the left and right vertical edge of each sheet approximately aligns with the vertical centerline of a stiffening channel so that the edge of two adjacent wall facing sheets (**4**) can be attached to a common stiffening channel (**2**) by means of a plurality of penetrating connectors or the like. As illustrated, a plurality of penetrating connectors (**6**), such as standard drywall screws, core board screws or the like, should be placed through each sheet and anchored into each stiffening channel, in generally vertical alignment with each underlying stiffening channel. In the preferred embodiment, penetrating connectors (**6**) will be placed along a generally vertical line, attached to each underlying stiffening channel and spaced no more than 18" apart.

[0063] Off the shelf, readily available drywall track is typically available in 10 ft. lengths, so a recommended installation process is to install one each 10' piece of top and bottom track (**3**), insert 2 to 3 panels (**1**), depending upon panel width, insert the appropriate number of stiffening channels (**2**) then install another top and bottom pair of track (**3**), etc., until the required wall length is completed. As shown in FIG. **9**, front facing sheets (**4**) and rear cladding sheets (**5**) may then be easily installed along the entire wall length.

[0064] Three alternative embodiments are shown in FIGS. **5***a*-**5***c*. The top illustration, FIG. **5***a*, shows a partition construction identical to the preferred embodiment discussed supra, with the exception of the absence of back cladding sheets (**5**). Most CAF panels can be textured, painted and/or generally finished comparably to gypsum wallboard, thus excluding cladding sheets (**5**) and finishing the surface of CAF panel (**1**) becomes a natural variation wherein the additional wall thickness and/or fire resistance provided by the gypsum wallboard is not needed. In the middle illustration, FIG. **5***b*, a symmetric variant is shown wherein a wider top and bottom track (**3**) is used to accommodate stiffening channels (**2**) placed on both sides of panels (**1**), and front facing sheets (**4**) are used on both wall faces. Finally, a third alternative embodiment is shown in FIG. **5***c* wherein the preferred embodiment is constructed, then a second layer of front facing sheets (**4**,**8**) and rear cladding sheets (**5**,**9**) are added and secured using a plurality of penetrating connectors (**7**).

[0065] In all variations and embodiments, the ⅝" gypsum wallboard used for front facing sheets (**4**) and rear cladding sheets (**5**) can be replaced by thinner or thicker gypsum wallboard, various wood-based panels such as plywood, OSB, MDF and the like, or CAF panels of various thicknesses. Preferably, CAF panels in the ½"-⅝" range will be used. Overall wall thickness, and the material selected for use as the front and rear facing sheets may largely be determined by specific physical requirements for the finished partition such as fire ratings and/or acoustic attenuation needs.

[0066] As shown in FIG. **4**, comparable to conventional drywall, the space between front facing sheet (**4**) and CAF panel (**1**) can easily accommodate utilities. For the purposes of illustrating this, FIG. **4** shows a utility/electric service detail in which a junction box (**14**) containing a duplex receptacle is positioned and attached to panel (**1**). It is recommended that junction boxes, gang boxes and/or other utility accommodating structures be positioned and attached the panel (**1**) before first facing sheet (**4**) is installed. Just as would be done when constructing a conventional drywall, a properly sized opening that corresponds to the location and size of the internal junction box, is cut in the front facing sheet (**4**) prior to positioning and attaching the front facing sheet (**4**) in place. As is also the case with conventional drywall, loose wiring, EMT, conduit, and the like can be run inside the subject partition as required and/or allowed by local building codes. Likewise, plumbing and other utility wiring such as communications cables can be accommodated in conventional fashion.

[0067] To properly utilize the partition disclosed herein and preserve optimum physical properties, utilities (electric, plumbing, etc.) run therein should only be provided to one side on the wall so as to not require openings to be cut through CAF panel (**1**). One of the primary attributes of subject partition is substantially improved acoustic attenuation. Preserving said acoustic attenuation properties requires that all panels (**1**) remain intact and uncompromised. Thus, no openings, regardless of size should be cut through CAF panel (**1**). This stipulation provides substantial benefit over current/conventional practices as the subject partition will always provides and in-tact, solid sound barrier and the acoustic attenuation properties will be consistent and predictable from application to application. In conventional drywall constructions, the acoustic attenuation property of the wall is often an inverse function of the number of utility openings cut therein; more openings beget less attenuation. Notably, in all embodiments, additional acoustic attenuation, and in particular, improved attenuation in certain frequency ranges may be gained by filling the interior wall space between CAF panels (**1**) and front facing sheets (**4**) will thermal or acoustic battings such as fiberglass, cellulose, mineral wool or the like.

[0068] The various embodiments disclosed herein are all explicitly non-load bearing and generally intended for partitioning interior space wherein acoustic attenuation is important, yet a low cost, quick and easily built wall is needed. Partitioning of interior commercial office space, school rooms, retail space and the like are typical examples of where this wall construction will find application.

[0069] Though providing the look, feel and function of a permanent partition, the wall/partition disclosed herein is much easier to disassemble and relocate than conventional drywall. Referring again to FIG. **1**, relocation requires the removal of rear penetrating connectors (**7**), followed by the removal of rear cladding sheets (**5**). If handled correctly, rear cladding sheets (**5**) may be reused. Front penetrating connectors (**6**) and optional facing sheet edge connectors (**10**) should then be removed, followed by the removal of front facing sheets (**4**). As with the rear cladding sheets (**5**), front facing sheets (**4**) may be reused if properly handled and/or preserved.

[0070] Next, stiffening channels (**2**) can be removed by sliding each to the end of a track or by tilting until clear of top channel (**3**). Optional stiffening channel connectors (**11**) should be removed to facilitate removal of stiffening channels (**2**) if present. CAF panels (**1**) may then be removed in the same manner as installed. This leaves only the top and bottom channels (**3**) which are removed just by standard drywall track removal techniques. Top and bottom track (**3**) will likely be damaged during removal and should not be reused. Otherwise, every component, including penetrating connectors, may be reused if desired. In some cases, the additional handling required to reuse rear cladding (**5**) and front facing sheets (**4**) may preclude their use and cause the use of new/replacement panels to be more economical.

[0071] While the subject invention has been set forth in this disclosure with respect to the preferred embodiment, and in some cases optional embodiments have been set forth, it will be appreciated by those skilled in the art that there are many ways to implement the invention without departing from the scope and spirit of the invention as disclosed herein.

[0072] The embodiments described supra are exemplary. Many details are found in the art; therefore, many such details are neither shown nor described. Even though numerous characteristics and advantages of the present invention have been described in the accompanying text, the description is illustrative only, and changes may be made in the detail, especially in matters of size and/or order within the principles of the invention to the full extent indicated by the broadest possible meaning of the terms of the following claims. The limits of the invention and bounds of the patent protection are measured by and defined in the following claims.

What is claimed is:

1. An improved wall or partition construction, comprising:

a bottom track member having a U-shaped cross section with front and back legs defining an interior channel area, said bottom track member centered along the bottom of a wall line with said interior channel area opening upward;

a top track member having a U-shaped cross section with front and back legs defining an interior channel, said top track member centered along the top of a wall line with said interior channel area opening downward, said top track member positioned in generally aligned and opposed proximity to said bottom track member and defining a vertical distance therebetween;

a plurality of CAF panels, each having a generally rectangular shape with a front and rear face and a top, bottom, left and right edge, said panels positioned between said top and bottom track members such that each top and bottom edge are slidably disposed within respective channel area, said panels positioned in relative edge to edge abutted relation;

stiffening means spanning vertical distance between said top and bottom tracks and slidably disposed within said interior channel areas;

a plurality of front wall facing sheets, each facing sheet having a generally rectangular shape with a top, bottom, left and right edge, said facing sheets positioned in relative edge to edge abutted relation, sized to span said vertical distance between said top and bottom track members and positioned such that said top and bottom edge of each facing sheet resides outside respective channel areas; and

penetrating connector means, said penetrating connector means positioned through each said front wall facing sheet and further penetrating into said stiffening means so as to make a rigid attachment therebetween.

2. The construction of claim **1** wherein said stiffening means comprises a plurality of elongated rail members, each having a length substantially equal to the distance between said top and bottom track members and sized to provide a friction fit when slidably disposed within said channel area of said top or bottom channel along with said CAF panel.

3. The construction of claim **2** wherein said elongated rail members have a cross sectional shape selected from the following group; square, rectangle, hat, circle, ellipse, U, C, I, and H.

4. The construction of claim **2** wherein said elongated rail members are comprised of standard SSMA 2½"×1½" furring channels.

5. The construction of claim **1** wherein said top and bottom track members are comprised of standard SSMA 3½" drywall track.

6. The construction of claim **1** wherein said front wall facing sheets are comprised of gypsum wall board.

7. The construction of claim **1** wherein said front wall facing sheets are comprised of plywood, oriented strand board, or other wood-based paneling.

8. The construction of claim **1** wherein said front wall facing sheets include a compressed non-wood fiber core.

9. The construction of claim **8** wherein said front wall facing sheets further comprise a CAF panel.

10. The construction of claim **1** wherein said penetrating connector means comprises a conventional penetrating connector selected from the group; drywall screw, deck screw, screw, nail, brad, tack and rivet.

11. The construction of claim **1** further comprising:

a plurality of rear cladding sheets, each cladding sheet having a generally rectangular shape with a top, bottom, left and right edge, said cladding sheets positioned in relative edge to edge abutted relation and positioned to span said vertical distance between said top and bottom track members and positioned such that said top and bottom edge of each facing sheet resides outside respective channel areas; and

penetrating connector means, said penetrating connector means positioned through each said rear cladding sheet and further penetrating into a said CAF panel so as to make a rigid attachment therebetween.

12. The construction of claim **11** wherein said rear cladding sheets are comprised of gypsum wall board.

13. The construction of claim **11** wherein said rear cladding sheets are comprised of plywood, oriented strand board, or other wood-based paneling.

14. The construction of claim **11** wherein said rear cladding sheets include a compressed non-wood fiber core.

15. The construction of claim **11** wherein said penetrating connector means comprises a conventional penetrating connector selected from the group; drywall screw, deck screw, screw, nail, brad, tack and rivet.

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