

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
DIVISION DE NUEVAS CREACIONES
E. S. D.

ASUNTO Solicitud Patente Invención No. **NC2019/0001059**
Solicitante **USG INTERIORS, LLC**
Actuación **Modificación Voluntaria – Trámite PPH**

Yo, **DANILO ROMERO RAAD**, identificado como aparece al pie de mi firma, con domicilio en la Carrera 7 No. 71-21, Torre A, Piso 8, Bogotá D.C., obrando como apoderado de la sociedad **USG INTERIORS, LLC**, domiciliada en Estados Unidos, solicitante de la patente en cuestión, me permito manifestar:

1. Modificaciones voluntarias a la solicitud

Considerando las disposiciones del artículo 34 de la Decisión 486 de la Comunidad Andina para que el solicitante pueda modificar la solicitud de patente en cualquier momento del trámite, me permito adjuntar a este memorial un nuevo capítulo reivindicatorio que consta de tres (3) reivindicaciones, ajustado a la patente emitida por la USPTO (Oficina de Patentes y Marcas de Estados Unidos) con número US 9,777,478 B1 a nombre del presente solicitante, en donde las modificaciones corresponden a las siguientes:

- Como primera medida, se modifica la reivindicación 1 con el fin de especificar que los elementos de puente son planos.
- Así mismo, se modifica la reivindicación dependiente 2 con el fin de eliminar la mención del uso del mismo donde se indica que es para desempeño acústico.

Con relación a las modificaciones anteriormente mencionadas, el solicitante manifiesta que las mismas no amplían de ninguna manera la materia objeto de la solicitud en estudio y se realizaron con el ánimo de ajustar la solicitud en trámite en Colombia a la solicitud original en Estados Unidos, con el fin de acogerse al tratado de aceleración de trámite de patentes (PPH) entre estos dos países y así poder acelerar el trámite de la presente solicitud.

2. Excedentes de Reivindicaciones

Con relación al número de reivindicaciones presentes en el nuevo pliego reivindicatorio, nos

permitimos informar que el nuevo pliego reivindicatorio incluye el mismo número de reivindicaciones al originalmente presentado.

De acuerdo con lo anterior, muy respetuosamente se le solicita a ese despacho tener en cuenta el nuevo capítulo reivindicatorio presentado acá y ajustado a la patente concedida en Estados Unidos, para todos los trámites posteriores de la presente solicitud.

3. Anexos

- Nuevo pliego reivindicatorio que consta de 3 reivindicaciones.
- Copia de patente concedida por la USPTO No. US 9,777,478 B1.

Señor Superintendente,

A handwritten signature in dark ink, appearing to read 'D. R. Raad', with a horizontal line underneath.

DANILO ROMERO RAAD
C.C. 79.547.687 de Bogotá
TP 79.289 del C. S. de la J.

REIVINDICACIONES

1. Un cielo raso suspendido que comprende una estructura reticular de perfiles de sujeción inferiores de chapa metálica alargados perfilados, espaciados en forma paralela y suspendidos en un plano horizontal desde la estructura superior, cada perfil inferior tiene una brida horizontal que tiene un grosor vertical efectivo, una pluralidad de paneles de yeso rectangulares alineados transversalmente a los perfiles inferiores y atornillados a las caras inferiores de las bridas con los extremos de los paneles de yeso formando juntas a tope ubicadas a medio camino entre los perfiles inferiores adyacentes, los elementos puente planos que cubren las juntas a tope y las bridas de tales perfiles inferiores adyacentes, siendo los puentes sustancialmente más rígidos que los paneles de yeso, por lo que los extremos del panel de yeso se pliegan hacia un nivel superior de las bridas cuando los extremos del panel de yeso se atornillan contra la placa superior de modo que se forma una junta de forma cónica en los extremos del panel de yeso para recibir la cinta y el compuesto para juntas por encima de la cara inferior de las áreas centrales principales de los paneles de yeso.

2. Un cielo raso suspendido de acuerdo con la reivindicación 1, en donde los paneles de yeso están perforados a través de sus áreas centrales.

3. Un cielo raso suspendido de acuerdo con la reivindicación 1, en el que los perfiles de sujeción inferiores están suspendidos en alineación paralela espaciada a perfiles reticulares de sujeción superiores dispuestos en forma transversal a los perfiles de sujeción inferiores y que sujetan los perfiles de sujeción inferiores en los bulbos de refuerzo adyacentes a las porciones superiores de los perfiles de sujeción inferiores.



US009777478B1

(12) **United States Patent**
Hulka et al.

(10) **Patent No.:** **US 9,777,478 B1**
(45) **Date of Patent:** **Oct. 3, 2017**

(54) **DRYWALL SHEET END JOINT**

(71) Applicant: **USG Interiors, LLC**, Chicago, IL (US)

(72) Inventors: **Samuel D. Hulka**, Mount Prospect, IL (US); **Peder J. Gulbrandsen**, Aurora, IL (US)

(73) Assignee: **USG INTERIORS, LLC**, Chicago, IL (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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(22) Filed: **Jul. 8, 2016**

(51) **Int. Cl.**

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E04B 9/28 (2006.01)

E04B 1/99 (2006.01)

E04B 1/84 (2006.01)

E04B 9/00 (2006.01)

E04B 9/04 (2006.01)

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

CPC **E04B 9/28** (2013.01); **E04B 1/8409** (2013.01); **E04B 1/99** (2013.01); **E04B 9/001** (2013.01); **E04B 9/0464** (2013.01)

(58) **Field of Classification Search**

CPC . **E04B 9/28**; **E04B 1/99**; **E04B 9/0464**; **E04B 9/001**; **E04B 1/8409**

See application file for complete search history.

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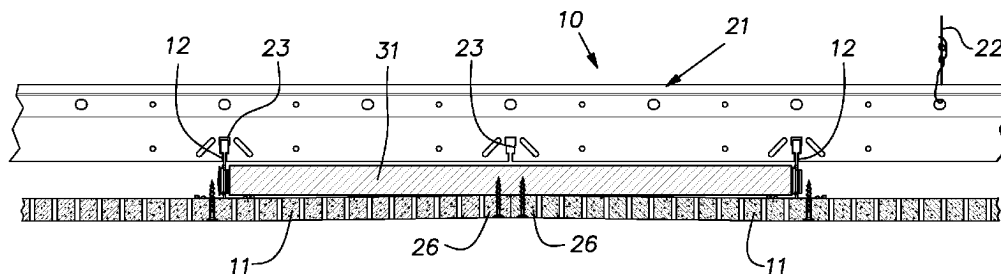
Primary Examiner — Patrick J Maestri

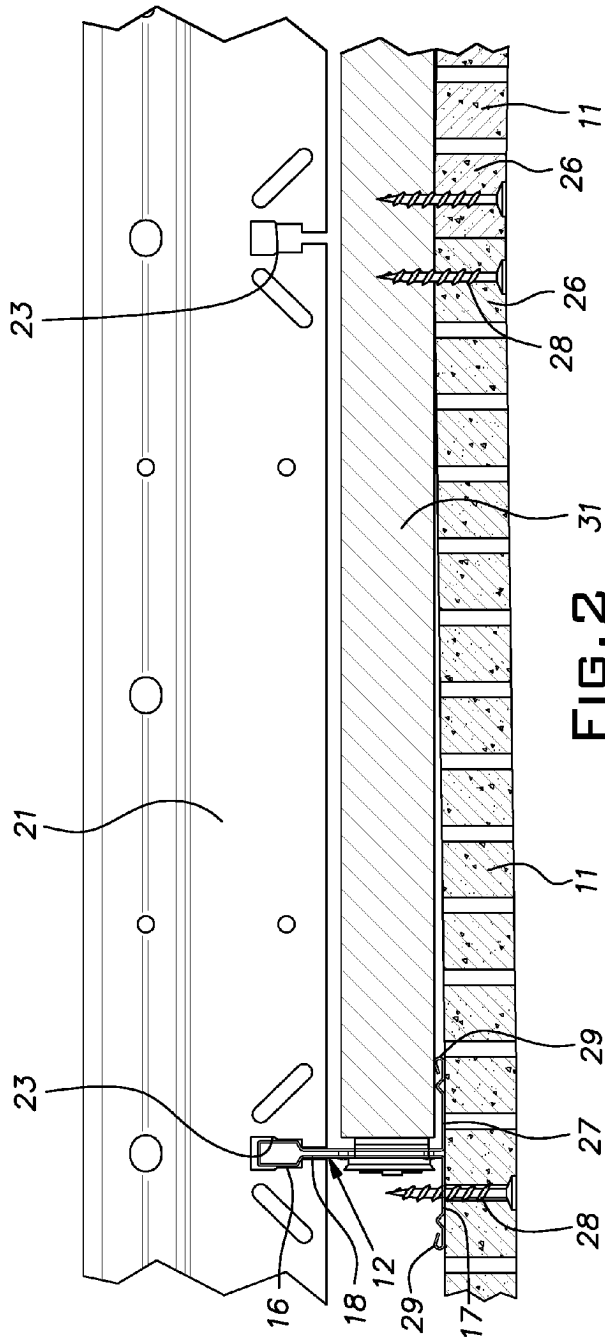
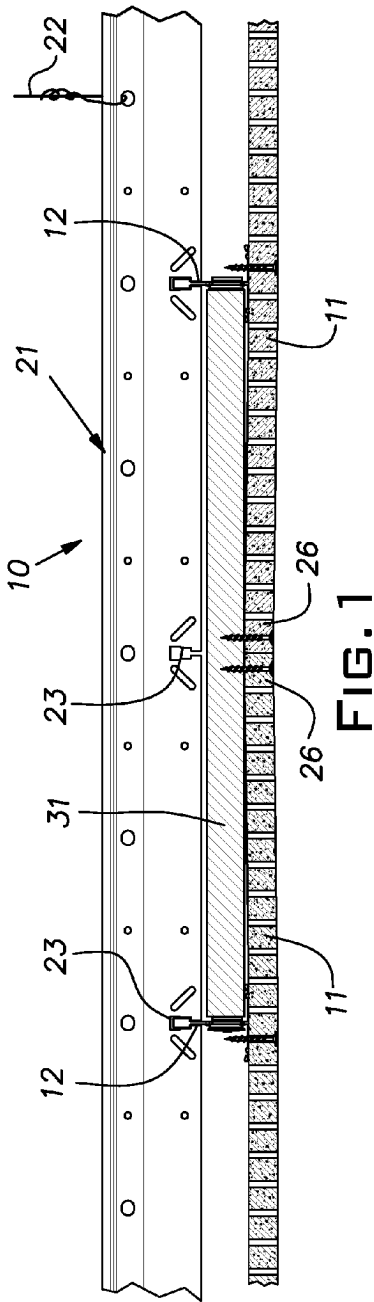
(74) *Attorney, Agent, or Firm* — Pearne & Gordon LLP

(57) **ABSTRACT**

A suspended ceiling comprising SUSPENDED metal runners in a horizontal plane, the runners each having a horizontal flange having an effective vertical thickness, a plurality of rectangular drywall sheets aligned crosswise to the runners and screwed to the flanges with ends of the drywall sheets forming butt joints midway between adjacent runners, boards overlying butt joints and adjacent flanges, the boards being substantially stiffer than the drywall sheets, whereby the drywall sheet ends are drawn up towards an upper level of the flanges when screwed against the overlying board so that a pseudo taper is formed on the drywall sheet ends.

3 Claims, 2 Drawing Sheets





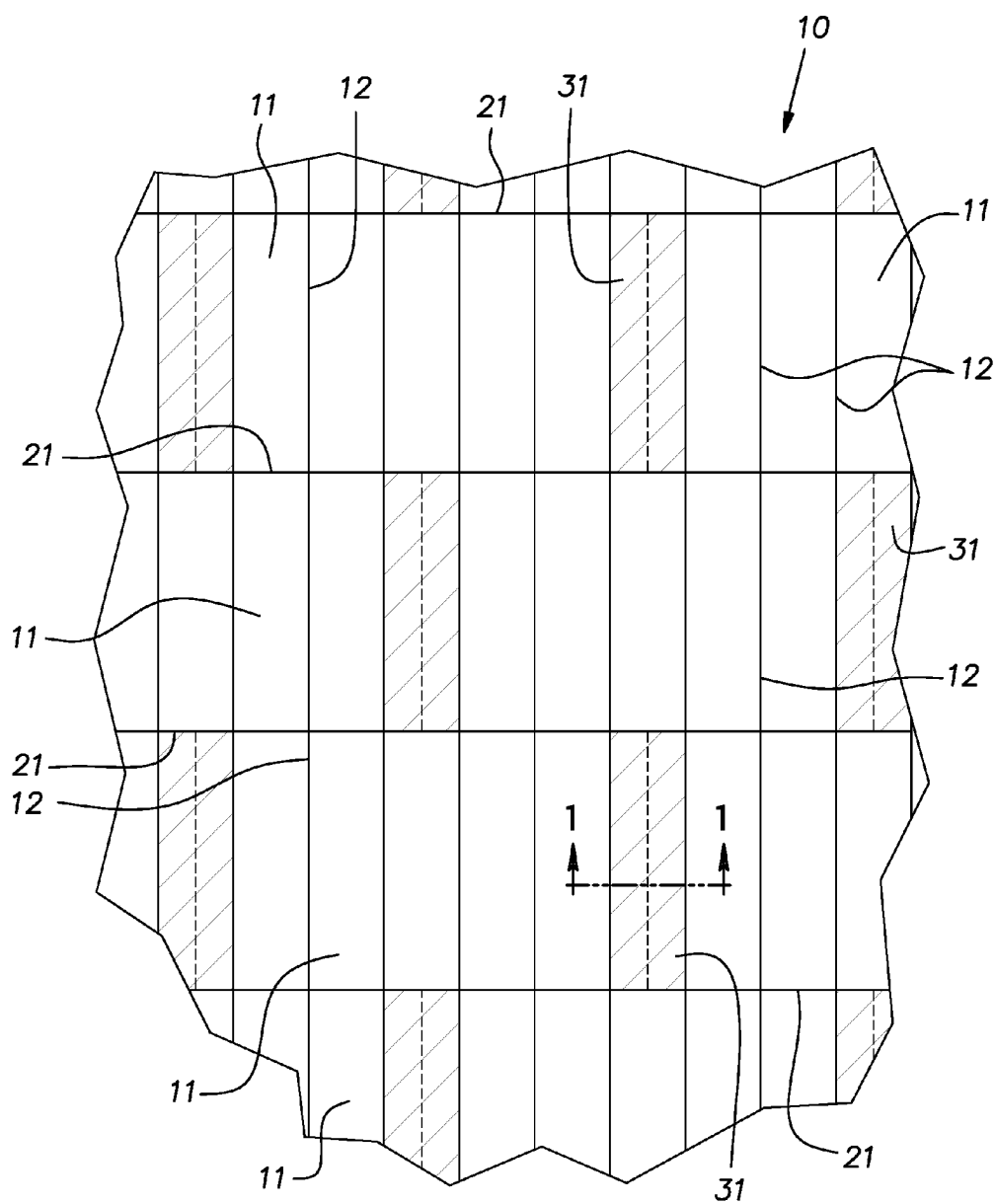


FIG. 3

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DRYWALL SHEET END JOINT**BACKGROUND OF THE INVENTION**

The invention relates to drywall ceiling construction and, in particular, to a construction in which taped end joints between drywall sheets are easily concealed.

PRIOR ART

Drywall sheets are manufactured as rectangular panels with a standard width of four feet and with a regular series of lengths of 8, 10, 12, 14 and 16 feet or metric industry equivalents. The long edges or margins of the sheets are tapered at their face side. The tapered margins are provided to enable tape and joint compound to be received in a joint above the face plane of the ceiling being constructed. The ends of the sheets are not tapered because of limitations of the production process used to make the sheets. Joints between the ends of drywall sheets, sometimes called butt joints, are difficult to conceal because the thickness of the joint tape intrudes into the plane of the face of the ceiling. The butt joints in ceilings are particularly difficult to conceal, in part, because they are often highlighted by indirect lighting. Frequently, a drywall ceiling is heavily textured to mask the presence of butt joints. Texturing of a ceiling is not practical where a relatively smooth surface is specified and/or where the drywall has acoustical properties derived from a porous face.

U.S. Pat. Nos. 7,578,107 and 8,898,986 illustrate examples of sheet metal strips or bars that can be used to suspend transverse sheet metal drywall grid tees. The strips or bars have regular keyhole-like slots along their length that capture the upper reinforcing bulbs of the tees. Drywall sheets are conventionally attached to the lower flange faces of the suspended grid tees with self-drilling screws.

SUMMARY OF THE INVENTION

The invention provides a grid-based structure for a suspended drywall ceiling that facilitates concealment of drywall butt joints. In the inventive structure, grid runners or tees are suspended in a horizontal plane on parallel regularly spaced centers. Drywall sheets are fastened to lower faces of the grid tees. The drywall sheets are positioned so that their lengths are crosswise to the grid runners and their abutted ends are cantilevered midway between adjacent grid runners. A flat faced rigid bridge member is located between the adjacent grid runners and overlies the abutted ends of the drywall sheets. The bridge member is supported on the top of the flanges of the adjacent runners so that its lower surface is spaced above the plane of the bottom faces of the runner flanges by the effective thickness of the flanges. Typically, the flange is thicker at hems on its longitudinal edges. The drywall sheet ends are screwed to the bridge member.

Because the bridge member lower surface is above the plane of the runner flanges, the ends of the drywall sheets are caused to be locally bent upwardly a precise distance corresponding to the effective thickness of the runner flange.

This bending of the ends of the drywall sheets has the effect of forming a pseudo taper to receive joint tape and joint compound. The pseudo taper is adapted to fully receive the joint tape and joint compound above the plane of the major face areas of the drywall sheets. The taper is limited both vertically and horizontally so that only a narrow band of joint compound is required to flush out the joint.

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The invention thus avoids butt joints where the tape and joint compound protrude from the plane of the main face areas of the drywall sheets. The invention is especially useful in acoustical drywall ceilings such as disclosed in U.S. Pat. Nos. 8,684,134, 8,770,345 and 8,925,677. Commonly, a heavy texture coat is used to conceal protruding taped butt joints. This approach is impractical with an acoustical ceiling since such coatings would block sound absorbing apertures in the drywall sheets and reduce or eliminate acoustical properties.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a fragmentary cross-sectional view of a butt joint of a suspended drywall ceiling taken in a vertical plane indicated at 1-1 in FIG. 3;

FIG. 2 is a view of the butt joint of FIG. 1 on an enlarged scale; and

FIG. 3 is a fragmentary schematic plan view of a suspended ceiling embodying the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

A suspended ceiling 10 includes rectangular drywall sheets or panels 11 attached to grid runners 12. The drywall sheets 11, as is conventional, are gypsum based and are typically 4 foot wide by, 8, 10, 12, 14 or 16 feet long and $\frac{3}{8}$, $\frac{1}{2}$ or $\frac{5}{8}$ inch thick. Dimensions recited in this disclosure are intended to include industry metric equivalents. Normally, the long edges of the sheets 11 are tapered for receiving joint compound and joint tape when the sheets are abutted along their long edges.

The illustrated grid runners 12 are of the T-style with an upper reinforcing bulb 16, a lower flange 17, and a vertical web 18 between the bulb and flange. The grid runner or tee 12 can be roll formed from a single elongated strip of sheet metal, typically, G40 hot dipped galvanized steel as known in the art.

A comparatively flat ceiling construction is obtained by using sheet metal hanger bars known in the industry and from U.S. Pat. Nos. 7,578,107 and 8,898,986 for example. The bars 21, suspended in a common horizontal plane by wires 22, are mutually spaced in parallel rows on, for example, 4 foot centers in a direction perpendicular to that of the subsequently erected tees 12. The bars 21 are positioned endwise relative to one another so that they present rectangular holes 23 in mutual alignment for capturing the reinforcing bulbs 16 for vertical overhead support of the tees 12.

FIG. 3 schematically illustrates an example of a layout of 4 foot by 8 foot drywall sheets 11 and grid tees 12 on 16 inch centers, the latter being determined by the regular spacing of holes 23 in the support bars or hanger bars 21. As indicated, the sheets 11 are arranged with their lengthwise direction perpendicular or crosswise to the longitudinal direction of the tees 12. The sheets 11 are further arranged so that their ends 26 are cantilevered and abutted at locations spaced midway from adjacent grid tees 12.

The sheets 11 are attached to lower faces 27 of the grid tees 12 with self-drilling screws 28 that penetrate both the sheets and the tee flanges as is conventional. Inspection of FIG. 2 shows that longitudinal edges of the grid tee flanges 17 are folded up into hollow hems 29 that increase the flange effective thickness, measured vertically across bottom to top

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of the flange elements. By way of example, but not limitation, the effective thickness can preferably be between about 0.50 inch to about 0.55 inch.

A bridge element **31** in the form of a flat rectangular rigid board is located in the grid space overlying abutted ends **26** of two drywall sheets **11**. The illustrated bridge **31** is a flat board with nominal planar dimensions of 4 foot by 15 $\frac{7}{8}$ inch and with a thickness of $\frac{5}{8}$ inch. Preferably, the width dimension is greater than the gap between adjacent flanges **17** so that the board **31**, once positioned, cannot readily fall off the flanges **17**. The board **31** is substantially more rigid (at least twice as rigid) than conventional drywall sheets. The abutted ends **26** of the sheets **11**, preferably after the sheets are first secured to the adjacent tees **12** by screws **28**, are drawn up to the bottom surface of the bridge board **31** by suitable screws **28**. In this manner, the ends of the drywall sheets **11** are bent upwardly a precise distance that approaches the effective thickness of the tee flanges **17**. The effect is to provide a pseudo taper on the drywall sheet ends **26**. This pseudo taper on both of the abutting sheet ends **26** forms a space of limited but adequate vertical dimension for completely receiving joint tape and joint compound above the plane of the main non-tapered face areas of the drywall sheets **11**. This enables the sheet **11** to be taped with a flatness that makes the butt end joints imperceptible when painted without significant texture. Joint tape is typically about 0.006 inch to 0.009 inch thick and 2 inch wide. The board is sufficiently rigid to draw the drywall ends up when screwed to it so that the pseudo taper 1 $\frac{1}{2}$ inch in from a butt joint edge is elevated at least 0.009 inch. A suitable board product is $\frac{5}{8}$ inch FIBEROCK® Aqua-Tough™ interior panels marketed by United States Gypsum Company.

The disclosed inventive suspension arrangement is particularly suitable for use with acoustical drywall products such as disclosed in the aforementioned U.S. patents. As disclosed in these patents, the drywall sheets are perforated throughout their major areas through both face and rear paper covering and the face covering is, in turn, covered with a non-woven pervious scrim. Ultimately the scrim is

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painted to conceal the holes while maintaining sufficient porosity to allow air passage and therefore sound transmission into the perforations. The present inventive arrangement enables butt joints of the acoustical drywall sheets to be readily taped and finished without a heavy and/or textured appearance coating to conceal the joints.

It should be evident that this disclosure is by way of example and that various changes may be made by adding, modifying or eliminating details without departing from the fair scope of the teaching contained in this disclosure. The invention is therefore not limited to particular details of this disclosure except to the extent that the following claims are necessarily so limited.

What is claimed is:

1. A suspended ceiling comprising a grid of parallel regularly spaced roll formed elongated sheet metal runners suspended in a horizontal plane from overhead structure, the runners each having a horizontal flange having an effective vertical thickness, a plurality of rectangular drywall sheets aligned crosswise to the runners and screwed to lower faces of the flanges with ends of the drywall sheets forming butt joints located midway between adjacent runners, flat boards overlying butt joints and the flanges of said adjacent runners, the boards being substantially stiffer than the drywall sheets, whereby the drywall sheet ends are drawn up towards an upper level of the flanges when the drywall sheet ends are screwed against the overlying board so that a pseudo taper is formed on the drywall sheet ends for receiving joint tape and joint compound above a lower face of major central areas of the drywall sheets.

2. A suspended ceiling as set forth in claim 1, wherein the drywall sheets are through perforated across their central areas.

3. A suspended ceiling as set forth in claim 1, wherein the grid runners are suspended in spaced parallel alignment from metal support bars arranged crosswise to the grid runners and gripping the grid runners at reinforcing bulbs adjacent upper portions of the grid runners.

* * * * *