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GYPSUM WALLBOARD, WALLBOARD CONSTRUCTION METHOD AND WALL STRUCTURE

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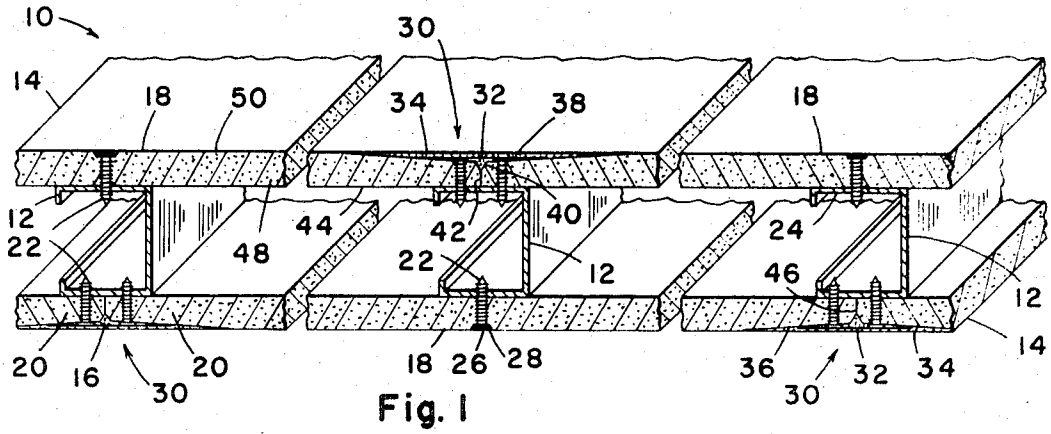



Fig. 1

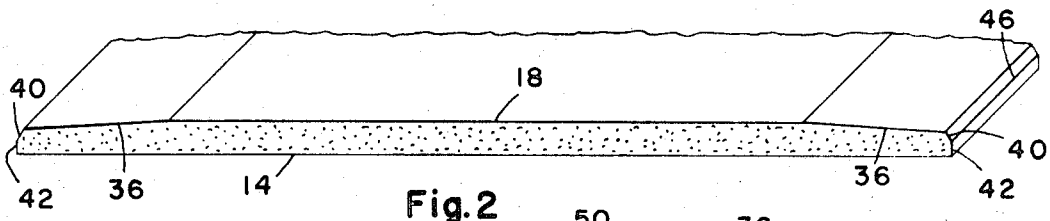



Fig. 2

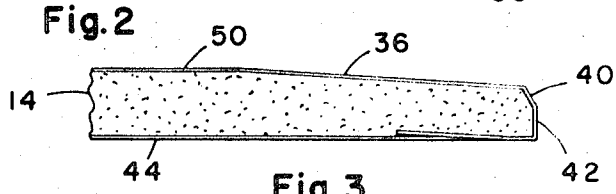



Fig. 3

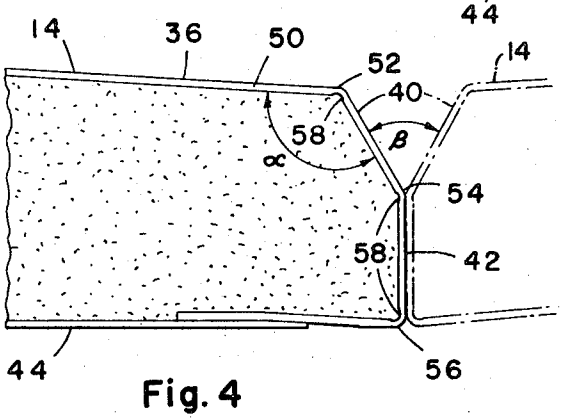



Fig. 4

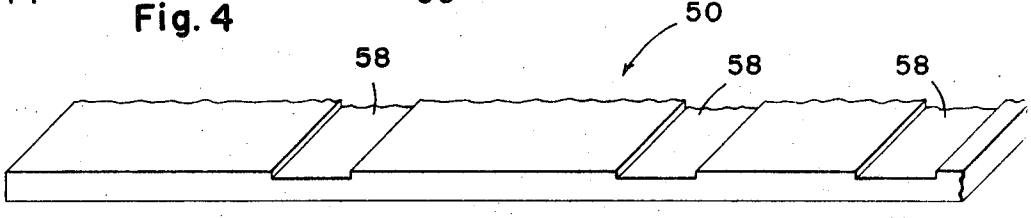



Fig. 5

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# GYPSUM WALLBOARD, WALLBOARD CONSTRUCTION METHOD AND WALL STRUCTURE

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U.S. Cl. 52—416 6 Claims

## ABSTRACT OF THE DISCLOSURE

A method of constructing a gypsum board wall and the improved wall, wherein the paper-covered gypsum board is formed of a uniform cross section throughout its length including a uniformly thick center portion, and two opposed tapered, beveled edges. Application includes affixing a pair of boards with tapered, beveled edges substantially abutting, followed by applying a coat of joint compound over substantially the full extent of the taper, thoroughly filling the bevel groove and embedding a narrow, thin reinforcing tape in this first coat of joint compound. Two additional coats of joint compound are applied over the respective dried prior coat, forming a final joint compound dried surface substantially flush with the surface of the center portion.

## Background of the invention

The present invention relates to gypsum wallboard and particularly wallboard intended for use with a joint concealing system to form what is commonly known as drywall construction.

Wallboard for drywall construction has for many years included an essentially square edge with the exception of a slight taper in the edge portion thickness, which, for example, with a nominal ½-inch board involved a ½-inch thickness from the center to about 3 inches from the edge, the thickness then tapering to about .44 inch at the edge.

Another form of board which has been used to some extent is a beveled edge board, having essentially a uniform thickness throughout and an edge formation which is a square edge except for the bevel at one corner of the edge. Thus the edge includes a flat portion which is perpendicular to the plane of the faces of the board and a second flat portion which forms an angle of about 135° with the perpendicular flat portion and also with an adjacent face of the board. Beveled edge board was not intended for use with a joint concealing system and, to the contrary, the bevel was provided to make it possible to use wallboards without a joint concealing system. Two square edged boards mounted abutting each other without a bevel and without a joint concealing system are not as aesthetically satisfactory as two abutting beveled edge boards with the joint exposed.

A prior problem with the common tapered edge board with a joint concealing system covering the joints has been what is referred to commonly as ridging and beading. This ridging and beading involves a physical change in the joint concealing system subsequent to its application over a joint and drying. This physical change is generally a formation of a slightly raised ridge or bead immediately over the location of the joint and this may



not become visible for several days, or even months, after the wall construction is complete.

On more than one occasion it has been proposed to minimize this ridging and beading by using a wallboard having the combination of a tapered edge for the reception of a joint concealing system with the taper terminating in a quarter round which extends to or nearly to the board edge back corner. The radius of such quarter rounds varied from about one-half the board thickness to about one and one-half times the board thickness, such variation being the result of an inability to control such an edge formation with available equipment.

As a result of the inability to control the quarter-round size, widely varying sized grooves were formed by the abutting edges of such boards. It was found that the use of these boards did minimize ridging and beading, apparently as a result of the joint compound getting between the board edges, drying or setting, and unitizing the two boards into a monolithic structure. However, when such quarter-round type edges having a radius of about one to one and one-half times the board thickness were used, the groove formed by two boards was of such size that an extra step is required of filling the groove with a first application of joint compound which must dry or set prior to applying the tape embedding coating of joint compound, or otherwise a reverse bead, or groove, results in the finished wall. The inconvenience and labor cost of an extra step of filling the joint groove, and waiting for this filling to dry or set, substantially offsets the advantage of avoiding ridging and beading.

The quarter round type edges having a radius of one to one and one-half times board thickness also suffer from the fact that, when positioning abutting edges, the boards tend to overlap one another. Also they necessitate the use of special, non-standard type of T-square, with an extra thick head portion of the T. Still further, it has been found that such boards are very uncomfortable to the bare hand when one is carrying the board by the side edge, as is common, because of the sharper corner formed at the board edge. This relatively sharp corner is also relatively more susceptible to damage, than other board edges.

## Summary of invention

This invention relates to a wallboard for use in drywall construction, wherein ridging and beading are avoided with substantially no extra inconvenience or cost, the novel wallboard consisting of a generally flat center portion and two side edge portions each edge portion including a board edge taper and a tapered front corner edge.

## Drawings

FIG. 1 is a cross-sectional perspective plan view of a completed drywall structure embodying the present invention.

FIG. 2 is a perspective view of the end of a gypsum wallboard embodying the present invention.

FIG. 3 is an end view of one tapered beveled edge of the wallboard of FIG. 2.

FIG. 4 is an enlarged end view of the beveled edge portion of the wallboard of FIG. 2. A second wallboard edge portion is shown in phantom, in adjacent relation as in the structure of FIG. 1.

FIG. 5 is an even further enlarged view of paper cover sheet of the beveled edge portion of FIG. 4, prior to manufacture of the gypsum wallboard.

Referring to FIG. 1, there is shown a plan view of a cross section of a hollow vertical wall **10** including vertical sheet metal elongate studs **12** mounted in spaced parallel relation. Novel tapered and beveled edge gypsum wallboards **14** are screw attached to studs **12**. Normally, four foot wide wallboards are attached, with their length extending vertically, to studs **12** which are mounted on two foot spacing, with the wallboard joints **16** of the respective two sides of the wall **10** located over alternate studs. Thus each stud **12** has screw attached to it the center portion **18** of a wallboard on one side of the stud **12** and two adjacent edge portions **20, 20**, of two adjacent wallboards **14, 14**, on the other side of stud **12**. The screws **22** extend through the wallboard and penetrate and grasp one of sheet metal flanges **24** of the stud **12**. The screw heads **26** of the screws **22** disposed at the center of a wallboard are concealed by a thin small patch **28** of joint compound, tapered to a substantially flush indistinguishable condition relative to the surrounding surface of wallboard **14**.

The joints **16** and the screw heads **26** of the screws **22** disposed at the edge portions **20** are concealed by a joint treatment system **30** whch consists of a combination of a joint reinforcing paper tape **32** and joint compound **34** which functions both to adhere the tape **32** to the wallboard **14** and to conceal the tape **32**. The two edge portions **20**, of the abutting wallboards, are each formed with a tapered face **36**, the two tapered faces forming a recess **38** whereby the joint treatment system may be applied in complementary tapered form producing a surface flush with the surface of the wallboard center portion **18**.

In accordance with the invention, the edge portions **20** also include a bevel **40** adjacent the tapered face **36**, and a perpendicular portion **42**, adjacent and perpendicular to the back face **44** of the wallboard **14**. In the preferred form of the invention, a wallboard of any given nominal thickness, the thickness throughout the center portion, has an edge portion **20** extending from the board edge **46** inward a distance at least one inch, preferably about 2 to 3 inches, for example, 2½ inches, with the edge portion thickness tapering from nominal thickness at the innermost part of the edge portion to about .060 inch less than nominal at the outermost part of the tapered face. Two abutting boards thus would form a recess five inches wide and .060 inch deep at the center, for the joint concealing system **30**. The bevel **40** forms an angle $\alpha$ of between 95° and 125° with the tapered face **36**, preferably about 100° to 120°, for example 110°. Perpendicular portion **42** has a width between about one-quarter and three-quarters of the board nominal thickness and preferably about one-half nominal thickness. For example, a one-half inch nominal thickness board tapers to 0.44 inch and has a bevel about 0.18 inch wide and a perpendicular portion about 0.26 inch wide.

Wallboard **14** is formed of a gypsum core **48** and a paper cover **50**. Prior to the manufacture of the wallboard **14**, the inner surface of the paper cover is scored along parallel lines disposed for forming the fold **52** at the edge of bevel **40** adjoining the tapered face **36**, the fold **54** at the opposite edge of bevel **40**, and fold **56** at the back corner of perpendicular portion **42**. The scoring **58** of the inner face consists preferably of the removal of a layer of the paper about .05 inch wide, and about .005 inch to .010 inch thick with the usual gypsum paper of about .020 inch thickness. This scoring is carefully controlled, as by a plurality of .05 inch wide, rotating abrasive stones, with spacers mounted therebetween.

The joint treatment system **30**, in accordance with the invention, is formed in three steps. An embedding layer of joint compound, of sufficient thickness to provide good adhesion, is disposed over a center portion of recess **38**, at least two inches in width and a two inch wide strip of paper reinforcing tape **32** is embedded therein. This embedding layer of joint compound also extends into and fills the opening between the adjacent bevels **40, 40** of the two abutting wallboards. In accordance with the above-defined size of the angle $\alpha$, it will be seen in FIG. 4 that an angle $\beta$, formed in the opening between two adjacent bevels **40, 40**, is between about 10° and 70°, preferably about 20° to 60°, for example about 40°. The tape **32** is embedded in the embedding layer immediately and the embedding layer of joint compound is allowed to set and dry, bonding the tape to the board. Two additional progressively wider coats of joint compound are successively applied and allowed to separately set and dry, the last coat being preferably about equal in width to the recess **38** width and thus being substantially flush with the surface of center portion **18**.

The joint compound, at least for the first coat for embedding tape and filling the opening formed by the bevels, is a low shrinkage, fast setting type joint compound, setting in about 90 to 110 minutes to a hardness such that a quarter pound Gilmore needle is substantially uniformly supported therethroughout, which method for establishing setting time is well known in the art.

The formation of the bevel **40**, using an internally scored paper, is susceptible of control in present day wallboard manufacturing processes and techniques, whereby the size of the opening formed between a pair of bevels is sufficiently uniform to permit combining of the filling of this opening and the step of embedding the tape. Accordingly, a unitized structure of two adjacent wallboards may be formed without any substantial increase in cost of application, providing a marked improvement in the art of drywall construction with minimized ridging and beading.

Having completed a detailed disclosure of the preferred embodiments of my invention, so that others may practice the same, I contemplate that variations may be made without departing from the essence of the invention or the scope of the appended claims.

I claim:

**1.** Gypsum wallboard comprising a paper cover and a set gypsum core, said wallboard including a center portion of substantially uniform thickness forming a major area of said board and two opposite side edge portions, each said edge portion being tapered on the face side of the board from the thickness of said center portion at the innermost part of said edge portion to about .010 inch to .100 inch thinner at the outermost part of said tapered portion, a bevel extending from said outermost part of said tapered portion to the outer edge of said wallboard, a perpendicular portion disposed substantially perpendicular to the plane of the face of said center portion, and a wallboard back face, said wallboard back face forming substantially a right angle with said perpendicular portion, said bevel forming an angle of between 95° and about 125° with said tapered portion, the ratio of the width of said perpendicular portion to the width of said bevel being from about 1:3 to about 3:1.

**2.** The wallboard of claim **1** wherein said bevel and said tapered face form an angle of about 100° to 120°.

**3.** The wallboard of claim **1** wherein said perpendicular portion is wider than said bevel width by a ratio of about 1½:1.

**4.** The wallboard of claim **1** wherein said paper is scored on the inner surface at each edge of said bevels and perpendicular portions with grooves of about .005 to .010 inch depth and about .05 inch wide.

**5.** A wall structure comprising a pair of wallboards as defined in claim **1** having respective side edges substantially abutting, whereby said adjacent bevels form a V-shaped opening of from about 10° to about 70° and said adjacent tapered portions form a relatively wide, shallow recess, said recess and said V-shaped opening being substantially filled with a set and dried joint com-

pound and a reinforcing tape embedded therein and bridging said V-shaped opening.

6. A wall structure as in claim 5 wherein the ratio of the width of the perpendicular portion of said wallboard edges to the width of said bevels is about 1½:1.


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