July 2, 1968 J. D. McNULTY 3,391,037

METHOD OF COVERING JOINTS IN INTERIOR WALL CONSTRUCTION

Filed Oct. 12, 1964

FIG. 1

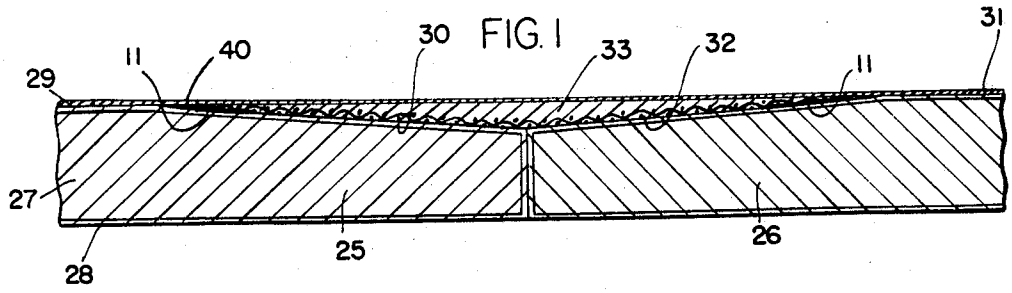


FIG. 2

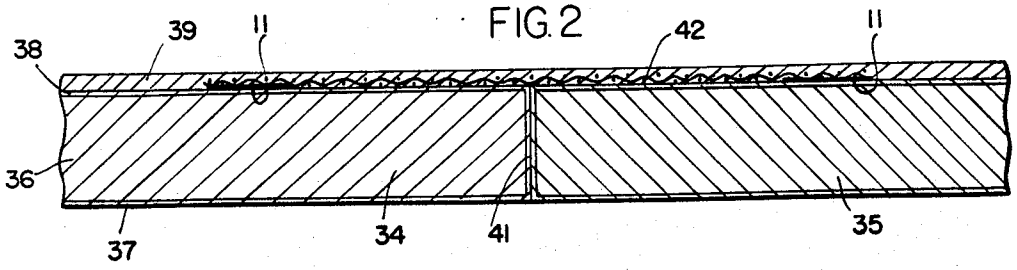


FIG. 4

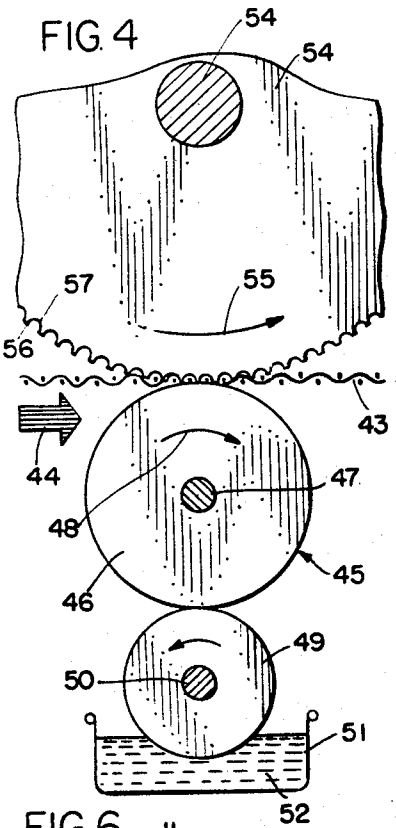


FIG. 3

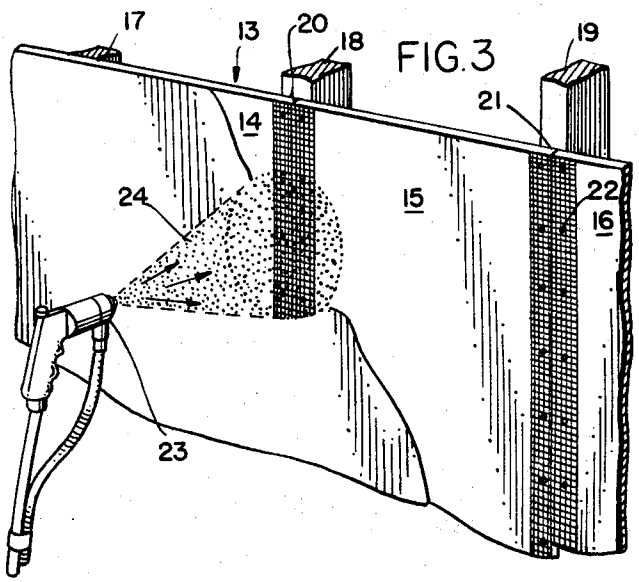


FIG. 5

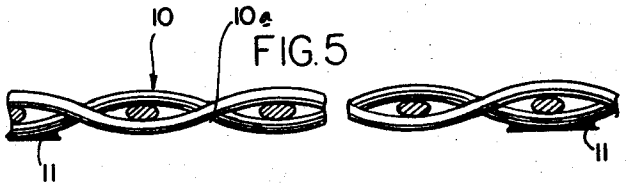
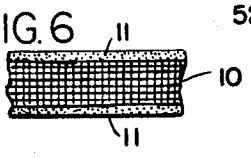


FIG. 6



INVENTOR:
JOSEPH D. McNULTY
BY
Dawson, Tilton, Fallon, Lungmus & Alexander
ATT'YS

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METHOD OF COVERING JOINTS IN INTERIOR WALL CONSTRUCTION

Joseph D. McNulty, 1550 N. Lake Shore Drive, Chicago, Ill. 60610

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ABSTRACT OF THE DISCLOSURE

A method of covering joints in interior wall construction. The method utilizes a roll of open-mesh web of fiber glass material which has a pressure-sensitive adhesive applied on one side thereof. The mesh openings are advantageously of the order of about 10 to about 20 per lineal inch. The end of the web roll is secured over an elongated joint defined by adjacent wall panels, the roll is unrolled over said joint while applying pressure to the unrolled web to conform the same to the wall panels on each side of the joint, and a thin coat of plaster is thereafter applied over the web and the wall panels.

Background of the invention

This invention relates to a joint reinforcing mesh web and method, and more particularly to the method of manufacture and use thereof.

The inventive tape finds utility in connection with reinforcing the joints developed by abutting wall panels. In the installation of "dry wall," it has been the practice to tape the joints between adjacent panels so as to present a smooth, uninterrupted surface. It will be appreciated that tape is also used on the corner angles as well. Reinforcing fiber glass mesh further has been used in thin wall plastering where gypsum panels have been coated with plaster layers of the order of 1/16 inch or so in order to develop a hard plaster finish. It is in these environments particularly where the invention finds utility.

Conventionally, dry wall installations are reinforced by a cellulosic tape which may be randomly perforated as by an electrical discharge process. Initially, the dry wall panels which have beveled edges are coated with a layer of cement, after which the tape is applied over the seam or joint. Ordinarily, several days elapse before the joint is ready for painting, inasmuch as additional layers of cement (usually of the casein variety) have to be applied, "feathered," sanded, etc. Thus, the economies and efficiency ordinarily considered implicit in installing dry wall are substantially lost because of the length of time required for dressing the joints.

In like fashion, thin wall plastering has been inefficiently utilized because of the time and labor involved in preparing the joints for the receipt of the covering layer of plaster.

I have discovered that when the pressure-sensitive adhesive is applied to the mesh only along the edges thereof on one side, preferably about ½ inch or ¼ inch in from the edge of the mesh, so as to leave the center of the mesh free to be engaged by the plaster or joint cement, an extremely effective joint is provided with the plaster, etc., enclosing the central portion of the mesh threads or strands so that the strands serve as reinforcing bars within the plaster.

A general object, therefore, of this invention is to provide a method and means for overcoming the above-mentioned drawbacks through the use of a unique reinforcing mesh equipped with pressure-sensitive adhesive along the edge areas thereof to be secured to the plaster base or board base while leaving the center of the mesh free to be engaged by the plaster or joint cement.

Another object is to provide an open mesh reinforcing strip equipped on the outside areas next to the edge and on one side thereof with a pressure-sensitive adhesive which is advantageously utilized in developing a joint covering for wall panels and wherein the open mesh between the adhesive edges develops a unique key with the overlying cement or plaster which encloses such unattached open mesh area.

Still another object is to provide a novel method of preparing a joint reinforcing tape wherein an open mesh web is coated on one side along the edges thereof so as to be readily unrolled from a spool, or the like, for rapid and efficient application to wall board panels.

A further object of the invention is to provide a novel procedure for developing an uninterrupted, smooth wall surface for the receipt of a covering layer (as by spraying) of paint, plaster, or other protective covering. In this connection, it will be appreciated that the term "wall" as used herein is employed in its generic sense to refer to an interior surface of a structure, whether it be a wall as such, ceiling, soffit, etc.

Other objects and advantages of the invention will be seen in the details of construction and operation set down herein.

The invention is explained in conjunction with the accompanying drawing, in which—

FIG. 1 is a fragmentary sectional view of wall-forming panels of the conventional dry wall type wherein the invention mesh is advantageously employed in overlying and reinforcing a joint or seam between adjacent panels;

FIG. 2 is a view similar to FIG. 1 showing in sectional fragmentary form two abutting panels with an overlying open mesh tape and covering, but wherein the panels are of the "square edge" variety;

FIG. 3 is a fragmentary perspective view of a wall in the process of being sprayed with a protective covering after the inventive tape has been applied;

FIG. 4 is a fragmentary sectional view of apparatus in somewhat schematic form for the purpose of developing the inventive reinforcing tape;

FIG. 5 is a broken, enlarged, fragmentary, sectional view of a mesh web constructed according to the teaching of the invention wherein the central portion of the mesh is free of adhesive and only the side edges thereof are equipped with pressure-sensitive adhesive; and

FIG. 6 is a broken top plan view of the mesh web showing the bands of adhesive applied to the side edges of the mesh.

Any suitable pressure-sensitive adhesive may be employed. Such adhesive may be formed by mixing crude rubber with zinc oxide, and the material may be maintained in its tacky stage with suitable ingredients such as oil, pitch, etc. Pressure-sensitive tapes of the type employed with masking tapes have been found to be very satisfactory. Since such pressure-sensitive adhesives are well known, a further description herein is believed to be unnecessary.

The invention makes use of an open mesh reinforcing web **10**, as shown in enlarged, fragmentary form in FIG. 5, with the pressure-sensitive adhesive applied in narrow bands **11** along the edges of the web, as shown in FIG. 6, the central portion of the web being free and unattached for receiving the plaster or joint cement, etc.

In operation, the tape is coiled on itself to form a roll and thereafter unwound to be placed on a wall to develop the configuration seen in FIGS. 1–3. In FIG. 3, for example, the wall generally designated **13** is developed by nailing panels as at **14**, **15** and **16** to studs **17**, **18** and **19**. Thereafter, a reinforcing mesh web of the character just described is applied over the joints **20**, **21**, etc., and so as to overlie the heads of the nails **22** employed to secure the various panels to the studs. Thereafter, a protective

covering may be employed, as illustrated in FIG. 3, by means of a spray nozzle **23** developing the conventional cone-shaped pattern of spray as at **24**.

Initially, I have referred to two types of wall installation wherein the invention has particular utility. The first-mentioned was that of dry wall, and the use of the invention in that connection can be appreciated from a consideration of FIG. 1. In FIG. 1, I show abutting dry wall panels **25** and **26**. Dry wall panels conventionally are ⅝ inch or ½ inch in thickness, comprising a gypsum core as at **27**, and sandwiching cellulosic sheets as at **28** and **29**. The sheet **29** is intended to face the interior of the room, and the edge of the panels **25** or **26** carrying the inwardly facing sheet **29** is beveled as at **30**. The width of the bevel is ordinarily one inch to 1¼ inch, and is of a depth slightly under 1/16 inch. Heretofore, it was necessary to apply a cement to the beveled area and apply the cellulosic tape. A widely employed tape heretofore used was "Perfa-A-Tape," a trademarked product of the United States Gypsum Company, Chicago, Ill. Widely employed for the installation of the initial coating of the casein-type cement and cellulosic tape was a bazooka-type tape-applying machine manufactured by the Ames Tool Company, of Omaha, Nebr. In the prior art technique, it was then necessary (after the application of the tape to the cement) to remove the excess cement, and this operation ordinarily occupied the first day of a wall installation. On the second day, additional cement was applied, and the cement carried out into the field of the board as at **31**, i.e., the unbeveled, flat central portion of the dry wall panels **25** and **26**. This would be feathered or edged to make an almost imperceptible joint. On the third day, the cement would be sanded so as to make the line of juncture of the cement with the field of the board imperceptible, and, in many instances, this process had to be repeated on the fourth day. Only then was the wall ready for painting.

According to the instant invention, the pressure-sensitive adhesive-equipped tape is applied to the joint in the fashion generally indicated in FIG. 3 to form a mesh layer such as is designated **32** in FIG. 1. It will be appreciated that the tape layer **32** is of the open mesh variety which voids any problem of trapping air or which otherwise might develop ripples or folds. At the same time, the open mesh, which advantageously is of the order of 5 to 20 openings per lineal inch, and which might be formed of steel or other metal, glass fibers, etc., affords an excellent anchor or key for the overlying cement. Inasmuch as the cement used herein and which is designated by the numeral **33** in FIG. 1 does not have to serve the function of anchoring the tape to the board, there is a saving of a full day's operation using the orthodox dry wall non-setting cement. In the event a fast setting cement is employed, the operation is simplified because it is not necessary to embed the tape or mesh in the cement. The mesh is already fastened over the cement.

The second area of utility mentioned hereinbefore is that relative to thin wall plaster, and, for this purpose, a showing is made in FIG. 2. In FIG. 2, I show panels **34** and **35** which are of the "square edge" variety, and which, like the dry wall panels, are developed by sandwiching a gypsum core **36** within fibrous sheets **37** and **38**. One difference between the panels **34–35** and **25–26** resides in the character of the sheets **29** and **38**, inasmuch as in the latter case somewhat more suction has to characterize the inwardly facing sheets for the receipt of plaster as at **39**, in contrast to paint as at **40** in FIG. 1.

In the illustration given in FIG. 2, the mesh web **42** is provided along its edges with pressure-sensitive adhesive **11**, the adhesive bands being preferably ¼ inch to ½ inch on the side of the web to be applied to the board, leaving the central portion of the web unattached to the board and free to be engaged as reinforcing in the coat of plaster or joint cement, etc.

As shown in FIG. 2, I overlay the seam or joint **41** existing between the panels **34** and **35** with the mesh web **42** so that the edges of the web are attached to the base while the center of the web is free to be engaged by the plaster. I then spray the layer of plaster **39** in the fashion indicated in FIG. 3. One or more layers of plaster may be utilized, depending upon the character of the finished coat. Further, the plaster may be troweled or otherwise merely smoothed, depending on whether a trowel finish or a texture finish is desired.

In the instance of the thin wall plaster process, I find the inventive tape advantageous in that it avoids the need for stapling or otherwise securing the tape in place over the joints existing between panels. In the past, this has resulted in some difficulty inasmuch as the tape has tended to "ravel" or otherwise become distorted and thereby constitute an imperfect reinforcement. Further, the imperfect anchorage of the tape according to the prior art practices has resulted in differences in suction between the joints and the field of the board, which results in unsatisfactory plaster covering. Here, it will be appreciated that the plaster, which is usually sprayed on in the fashion indicated in FIG. 3, has been given a predetermined "set" or crystallization time. This time is developed according to the needs of the plaster to take up the water to convert the hemihydrate of gypsum to the dihydrate. Where differences in suction exist, there is either too much or too little competition for the free water, which results in imperfect crystallization of the calcium sulfate hemihydrate.

In particular, where a square edged board is used according to the previous techniques and the tape is set in joint cement or in thin coat plaster applied only to the joints as they occur in the surface of the wall or ceiling, it was difficult to get the tape to lie flat and without "gathers." This sometimes has resulted in ridges developing at the joints and showing through the finished surface. In some instances, since the coat is very thin and the staples are not well set, it results in the staple showing through or in tripping a trowel which is used in finishing the surface of thin coat plaster.

I have found it advantageous to use Fiberglas mesh as the base material of the tape and with 5 to 20 meshes per inch extending both longitudinally and transversely of the length of the tape. Where the tape is employed for dry wall construction and the panels **25** and **26** are edge beveled as seen in FIG. 1, I prefer to size the width of the tape so as to substantially overlay the V-shaped depression developed by the bevels **30**. This results in a tape having a width of the order of 2 to 2½ inches.

While I prefer to apply the pressure-sensitive adhesive only to the side edges on one side of the web, the adhesive may be applied to the entire one side of the web if it is strong enough to provide by itself reinforcement to the joint.

The following constitute examples of the practice of the invention:

Example I

For the purpose of developing the mesh web **10**, I employed a glass fiber mesh screen having a width of 2 inches with 10 meshes to the inch (in both directions). To this was applied on one side only and along the edges thereof in a band of ¼ inch, adhesive base U–7–45B, which is an emulsion base for formulating pressure-sensitive adhesive with synthetic rubber latices manufactured by the American Resinous Chemicals Corporation.

Example II

To a glass fiber screen or web having a width of 2½ inches and having 14 meshes per inch extending in the direction lengthwise of the tape and 14 meshes per inch extending transversely of the tape was applied latex rubber having zinc oxide dispersed therein, the pressure-sensitive adhesive being applied only to the edges of the tape and dried thereon. The tape or web was rolled into rolls for subsequent application in the fashion indicated in FIG. 3.

Any suitable means for applying the pressure-sensitive adhesive to only one side of the tape and along the edge thereof, preferably to form ¼ to ½ inch bands, may be employed. In the specific illustration given in FIG. 4, a continuous web or length of tape is designated **43** and is seen to be moving in the direction of the arrow **44**. An adhesive-applying apparatus generally designated **45** is seen to include an adhesive-applying roll **46** suitably carried by a shaft **47** for rotation in the direction of the arrow designated **48**. Adhesive is metered to the roll **46** from the roll **49** suitably rotated by means of shaft **50**, and which is seen to be disposed within an adhesive-carrying trough **51**—the adhesive being designated **52**.

In order to limit the application of the adhesive coating to only one side of the tape **43** and to restrict the same from filling in the interstices as at **10***a* in FIG. 5, I employ a grid roll (see FIG. 4). The grid roll **53** is equipped with a suitable shaft **54**, and is rotated in the direction of the arrow **55**. The cylindrical outer surface of the roll **53** is equipped with a grid-like arrangement of projections and depressions as at **59** and **57**, whereby the projections **56** are adapted to enter the interstices of the tape **43** to limit the flow of liquid adhesive **52** thereinto.

While in the foregoing specification a detailed description of an embodiment of the invention has been set down for the purpose of explanation, many variations in the details herein given may be made by those skilled in the art without departing from the spirit and scope of the invention.

I claim:

1. In a method of interior wall construction, the steps of providing a roll of open-mesh web constructed of glass fiber material and having a pressure-sensitive adhesive on one side thereof, the mesh openings being of the order of about 10 to about 20 per lineal inch, securing the end of said web roll over an elongated joint defined by adjacent wall panels, unrolling said roll over said joint while applying pressure to the unrolled web to conform the same to said adjacent wall panels on each side of said joint, and applying a thin coat of plaster over said web and said adjacent wall panels.

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HAROLD ANSHER, *Primary Examiner.*