May 14, 1968 G. W. GREEN 3,382,636

GYPSUM LATH CONSTRUCTION

Filed July 24, 1964

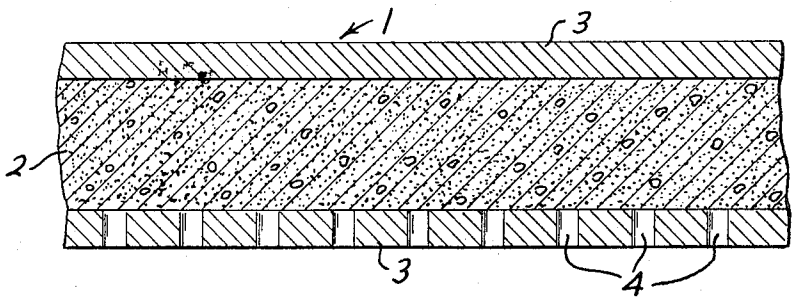

Fig-2

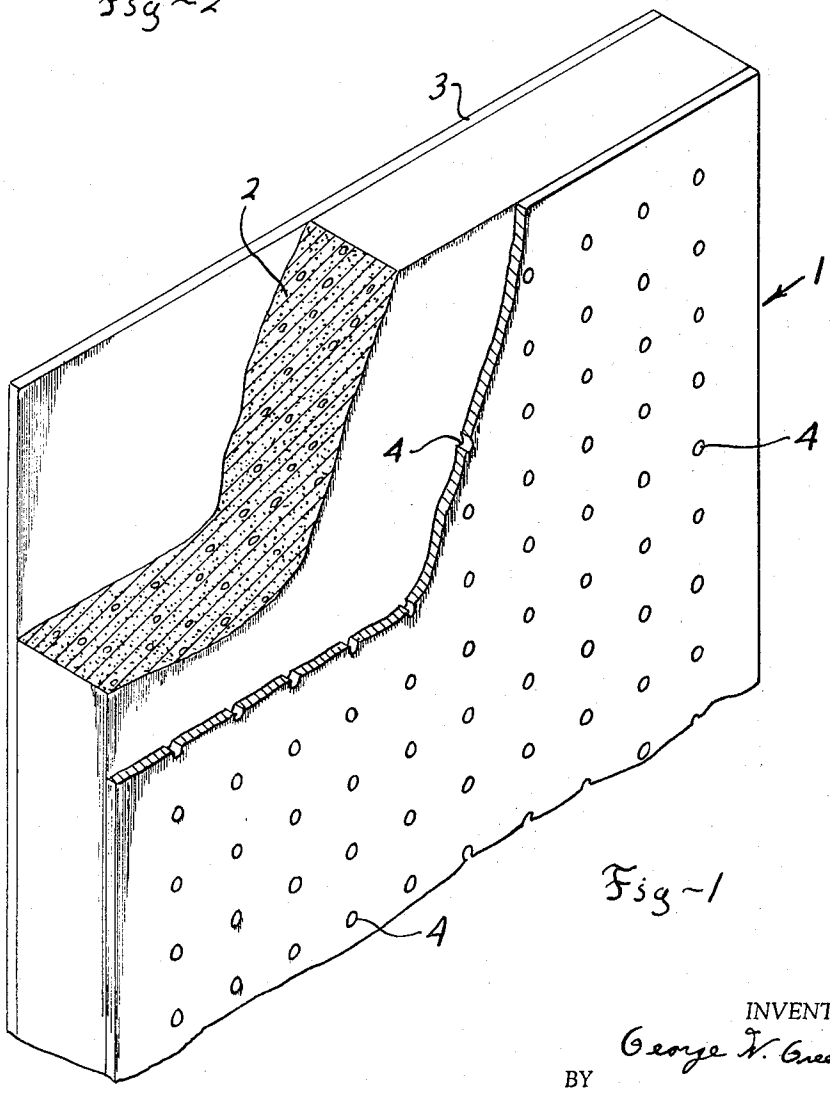

Fig-1

INVENTOR.
George W. Green
BY
Symmes, Dees & Lechner
ATTORNEYS

United States Patent Office 3,382,636 Patented May 14, 1968

3,382,636

GYPSUM LATH CONSTRUCTION

George W. Green, West Chester, Pa., assignor, by mesne assignments, to Georgia-Pacific Corporation, Portland, Oreg., a corporation of Georgia

Filed July 24, 1964, Ser. No. 384,893
3 Claims. (Cl. 52—310)

ABSTRACT OF THE DISCLOSURE

A paper covered gypsum lath construction having unique water absorbing characteristics is disclosed for use with thin coating plasters. The paper is coated with a wetting agent, such as an alkyl aryl sulfonate, an alkyl ester sulfonate or an alkyl aryl ether, and the paper is provided with pin holes distributed over the surface thereof.

This invention relates to improvements in gypsum lath and more particularly, to a paper covered gypsum lath construction while has unique water absorbing characteristics.

While not limited thereto, the invention is especially suitable when used as a base for the so-called thin coat plastering systems which have been developed recently. In accordance with the techniques which are employed, a single thin finished coating ranging from 1/16" to 1/8" in thickness is applied directly to the lath to give a wall having the same appearance as obtained with conventional multi-coating plastering systems.

In the use of these thin coat plasters, problems arise because the thin coating contains a large amount of water when applied. Until a significant amount of this moisture is removed from the plaster, it cannot be properly troweled. Air-drying has been found to take so much time that the plaster may be so close to the point of setting when it is in a trowelable condition that insufficient time is left to do the troweling job satisfactorily. For this reason, it has been the practice to apply a relatively rough base coat which is porous and absorbent and then to cover the base with the relatively thin finished coating. This practice is somewhat self-defeating since the material and labor savings which were expected to be gained with these thin coat plastering systems cannot be realized when more than one coat is applied.

Considerable effort has been made to eliminate the use of this base coat. One recent approach that has been partially successful in overcoming the problem involves the use of a paper covering for the gypsum lath which is provided with tiny pin holes over the surface which is to be covered with the thin coat of plaster. The pin holes provide passageways through the paper which permit the water in the plaster to pass through to the relatively absorbent gypsum core. The use of this pin holed paper creates sufficient suction to prevent sagging of conventional thicker coats of plaster but still does not give a great enough increase in troweling time to be satisfactory when thin coat plasters are applied. This is believed to be because the surface tension tends to build up around and within the holes after an initial portion of the water in the plaster is absorbed, following which little or no water may be absorbed.

Surprisingly enough, we have discovered that by coating the surface of pin holed paper with a wetting agent, an extremely rapid withdrawal of the moisture in the thin coat of plaster is effected. The moisture withdrawal rate is not only much faster than that achieved by using either the pin holed paper alone or the wetting agent alone, but also much greater than might be expected as a result of the combination. In fact, in typical samples it has been found that moisture withdrawal takes place at a rate

of about ten times that achieved when using pin holed paper alone and about three times that which is achieved when using treated paper alone. Thus, the invention provides an extremely effective and simple means of increasing the troweling time available to the plasterer and also improves the finished surface resulting when using the new thin coat plaster.

How the foregoing and other objects of the invention are achieved will become more fully apparent from the following description and the accompanying drawings in which:

FIGURE 1 is an isometric projection showing, in somewhat enlarged form, a piece of gypsum lath manufactured according to the present invention; and

FIGURE 2 is an enlarged sectional view of a portion of a lath of the type shown in FIGURE 1.

In accordance with the present invention the lath 1 comprises a gypsum core 2 generally having a thickness of about 1/2". The core 2 is sandwiched between sheets 3 of relatively smooth paper which may be coated on one side with an adhesive in order to secure the product together. The thickness of the paper is somewhat exaggerated in the drawings for purposes of illustration and in practice is the same as that conventionally used in the manufacture of lath of this type and may be, for example, in a typical product, about 1/32" thick. Typical lath pieces are 4' by 8' although other sizes may obviously be made if desired.

One side of the lath shown in the drawings is provided with small apertures or pin holes 4. While both sheets of paper may be provided with these pin holes, as a convenience to the plasterer in constructing walls and partitions, only one sheet need be so treated in carrying out the invention. These holes need be merely pin pricks having a diameter of about 1/32", although larger holes as large as 1/16" may be employed if desired. The holes should extend through the paper and through any adhesive coating thereon.

As shown in the drawings, the holes are placed in relatively closely spaced rows, the holes geing generally spaced on about 3/8" centers. While the rows could be staggered if desired, the aligned arrangement shown in FIGURE 1 works very effectively.

As was mentioned above, the holes provide passageways for the excess water to pass into the relatively absorbent gypsum core. Upon careful analysis and study, however, I have determined that while the rate of moisture withdrawal is satisfactory for a short while after the plaster is applied with lath of this type, it very shortly tends to slow down. More often than not, there is not sufficient troweling time available when a thin coat of plaster is applied to this type of lath. In carrying out the invention, I have found that when pin holed paper is treated with a wetting agent the finished lath will continue to withdraw enough moisture from the thin coat of plaster so that within a relatively short time after application, the plaster has reached a workable consistency. While the reasons for this result are not fully understood, it is believed that the wetting agent carried by the plaster prevents the build-up of surface tension in the water which collects in and around the holes shortly after the plaster is applied.

Various wetting agents which are capable of causing water to rewet and repenetrate the paper at a substantially faster rate than paper not treated with the substance can be employed in accordance with the invention. The several types which are commercially available are quite satisfactory, and there do not appear to be any serious limitations on the types which may be used, based on chemical considerations, aside from that of general compatibility with paper and gypsum plaster.

In particular, the sulfonated organic wetting agents

give very satisfactory results. One example is the alkyl aryl sulfonate sold under the trade name Ultrawet 30–DS as made by the Atlantic Refining Company, Philadelphia, Pa. This is an anionic liquid material believed to be an alkyl benzene sodium solfonate. Another sulfonated anionic wetting agent which gives good results is the alkyl ester sulfonate sold under the trade name Nopco 2272–R as made by Nopco Chemical Company, Harrison, N.J., which is believed to be a sulfonated fatty butyl ester.

Still another effective wetting agent which has been employed is a non-ionic material sold under the trade name Triton X120 by the Rohm & Haas Company, Philadelphia. This is an alkyl aryl ether believed to be an alkyl aryl polyether alcohol.

The wetting agent can be applied to the paper at any stage of the manufacturing process, for example, on the surface of the paper at the calendar stack at the paper mill or it may be applied to the finished perforated lath. In accordance with the preferred practice, however, gypsum lath is manufactured by applying paper previously treated at the calendar stack to the gypsum core and then the finished product is perforated with the pin holes. When following this practice, a non-volatile agent should be employed to avoid its volatilization in the board mill kiln, which may subject the paper to temperatures of about 200° F. For economic reasons the wetting agent is preferably applied as a dispersion on the surface of the paper.

In the following table the time required for three drops of water to be absorbed was measured and the results illustrate the effectiveness of lath treated with Nopco 2272–R in accordance with this invention:

Lath faced with:	Time in seconds
Untreated paper	250
Pin holed alone	73
Treated paper alone	25
Treated and pin holed paper	7

In this test, six drops of water at 72° F. are delivered to the paper and the time measured within which exactly three drops have disappeared.

Lath produced in accordance with this invention has proved to be very effective in practice in giving the plasterer sufficient working time to trowel the product, since the plaster reaches a workable consistency much more quickly than has heretofore been the case. There is very little waiting period before it can be troweled. Plastering systems using lath constructed according to the present

invention contribute in large measure to the success of the thin coat plastering systems, making possible equal or superior results to those gained by conventional plastering methods, with significant savings in cost.

I claim:

1. A gypsum plaster board product comprising; a relatively solid gypsum core, paper facing sheets overlying said core on each side thereof, at least one of said sheets consisting of pin holed paper, the pin holes in said paper being distributed over the entire surface thereof and extending therethrough to provide for the passage of water into the core, the exposed surface of said perforated paper being coated with a wetting agent.

2. A gypsum plaster board product comprising; a relatively solid gypsum core, paper facing sheets overlying said core on each side thereof, at least one of said sheets consisting of pin holed paper, the pin holes in said paper being distributed substantially over the entire surface thereof and extending therethrough to provide for the passage of water into the core, the exposed surface of said perforated paper being coated with a wetting agent selected from the class consisting of alkyl aryl sulfonates, alkyl ester sulfonates, and alkyl aryl ethers.

3. A gypsum plaster board product comprising; a relatively solid gypsum core, paper facing sheets overlying said core on each side thereof, at least one of said sheets consisting of pin holed paper, the pin holes in said paper being distributed substantially over the entire surface thereof and extending therethrough to provide for the passage of water into the core, the exposed surface of said perforated paper being coated with a non-volatile organic wetting agent.

References Cited

UNITED STATES PATENTS

907,877	12/1908	Rader	156—46
1,464,360	8/1923	Hicks	156—46
1,538,087	5/1925	Buttress	156—44
2,342,462	2/1944	Farmer et al.	156—44
2,408,488	10/1946	Sorensen	156—46
2,711,377	6/1955	Riddell	156—44
2,879,662	3/1959	Spinelli	161—113

ROBERT F. BURNETT, *Primary Examiner.*

ALEXANDER WYMAN, *Examiner.*

R. H. CRISS, *Assistant Examiner.*