

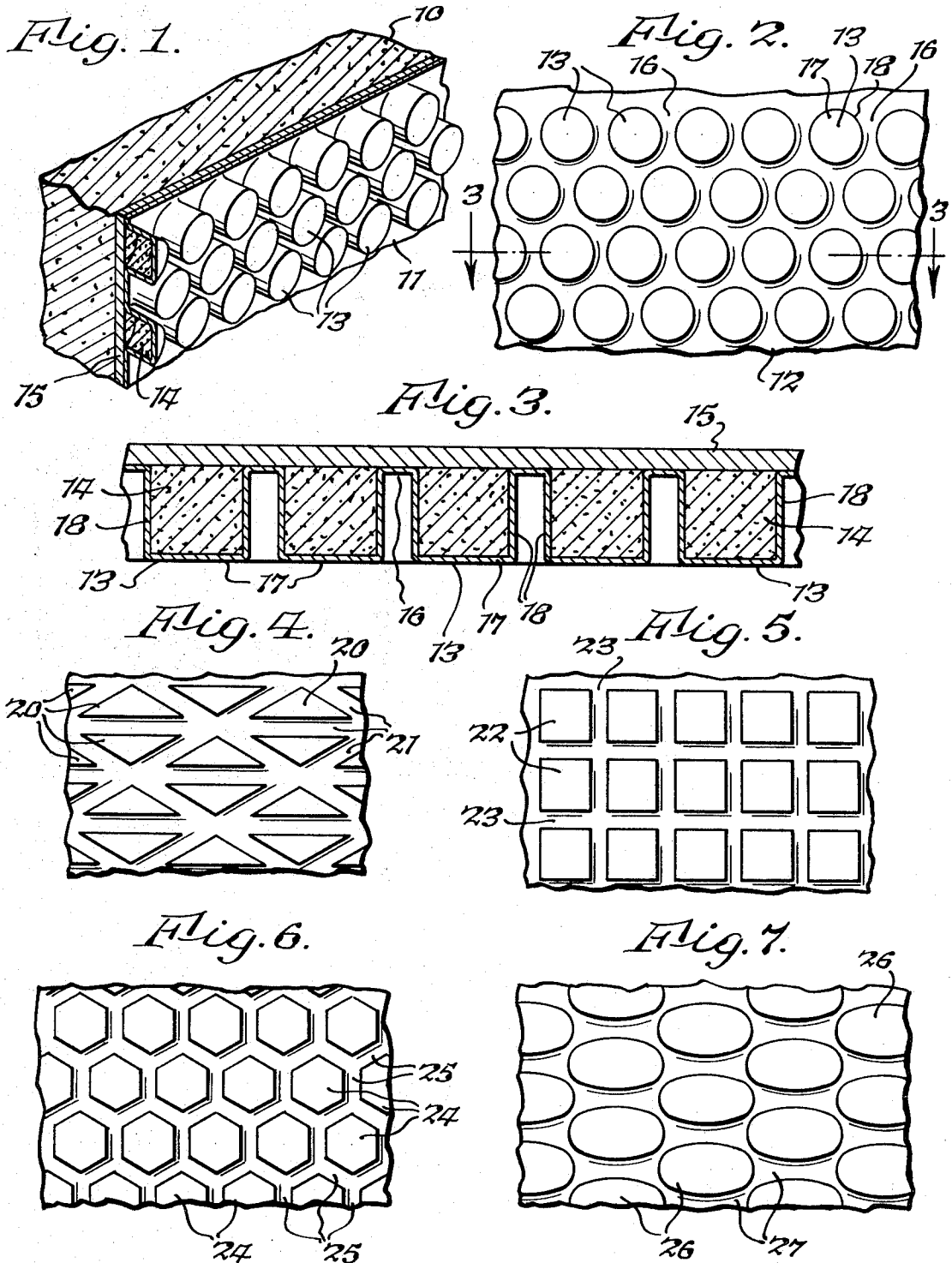
Feb. 9, 1971

I. T. AGRO ET AL
BUILDING COMPONENT

3,561,177

Filed July 16, 1968

3 Sheets-Sheet 1



INVENTOR.
Ignatius T. Agro & Louis I. Chiusolo
BY
Joseph P. Gastel
ATTORNEY.

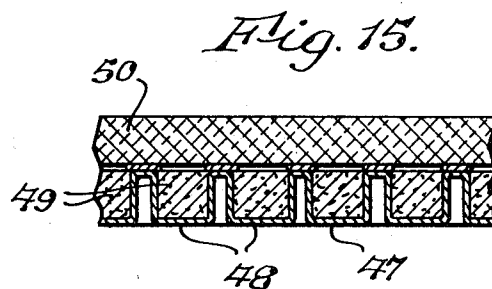
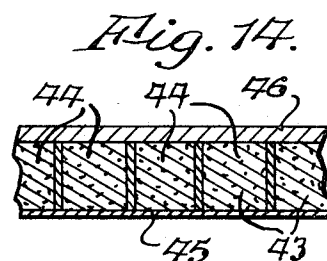
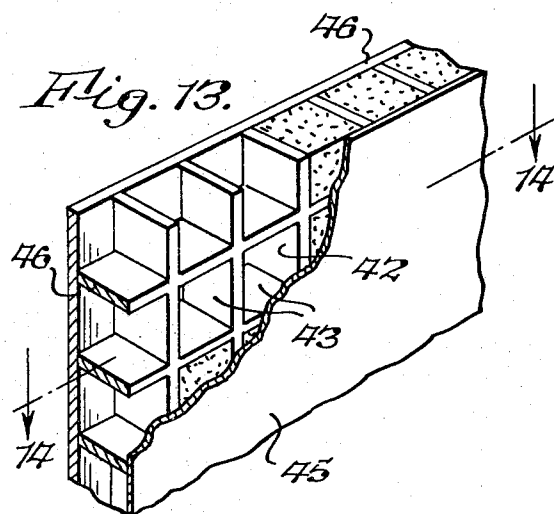
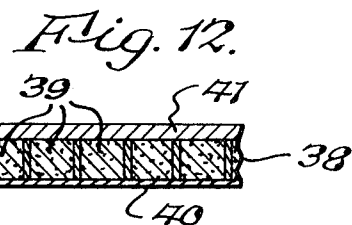
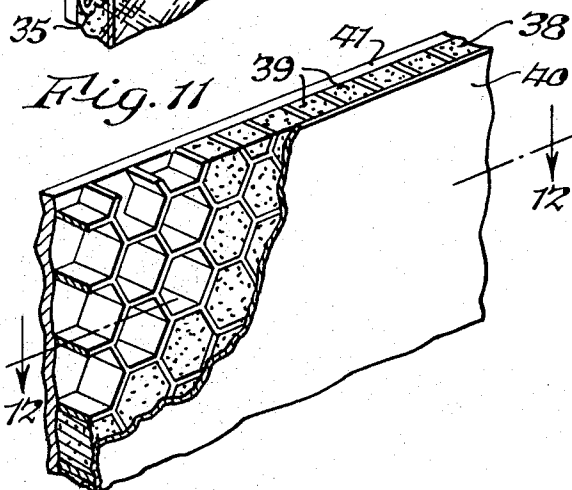
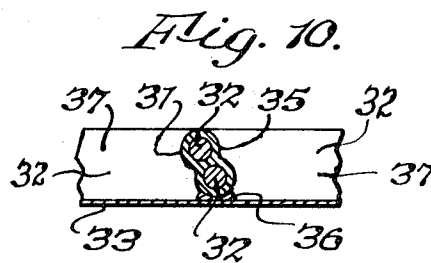
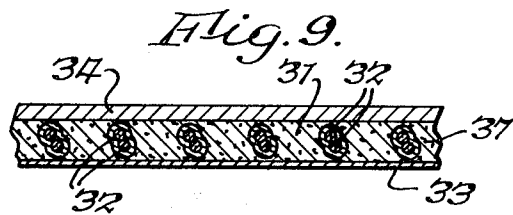
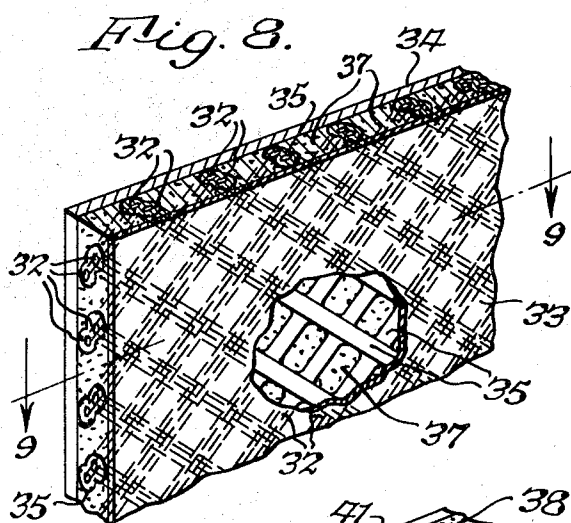
Feb. 9, 1971

I. T. AGRO ET AL
BUILDING COMPONENT

3,561,177

Filed July 16, 1968

3 Sheets-Sheet 2



INVENTOR,
Ignatius T. Agro & Louis L. Chiusolo

BY

Joseph P. Gastel
ATTORNEY.

Feb. 9, 1971

I. T. AGRO ET AL

3,561,177

BUILDING COMPONENT

Filed July 16, 1968

3 Sheets-Sheet 3

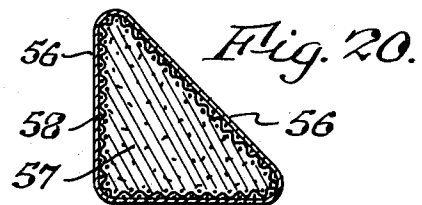
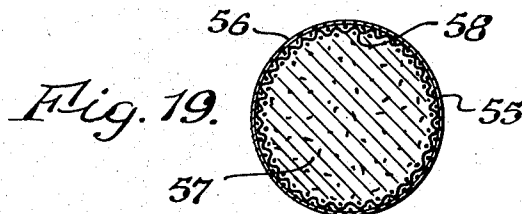
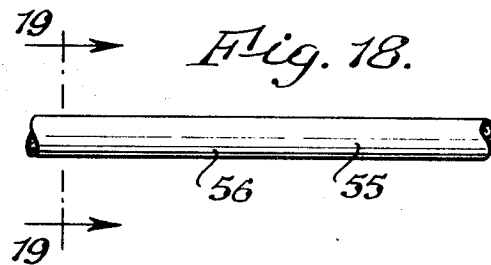
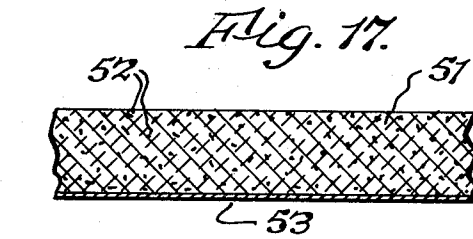
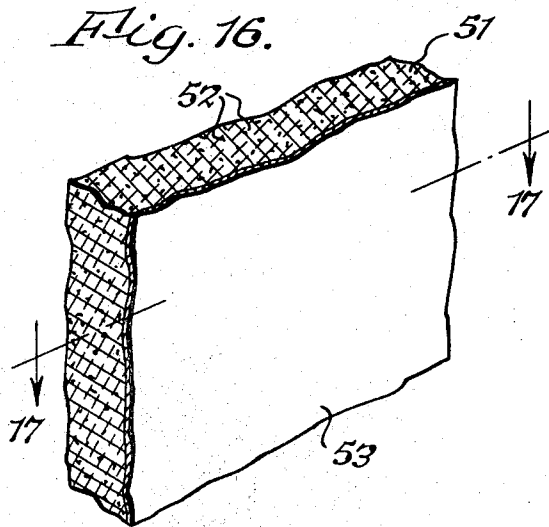


Fig. 21.

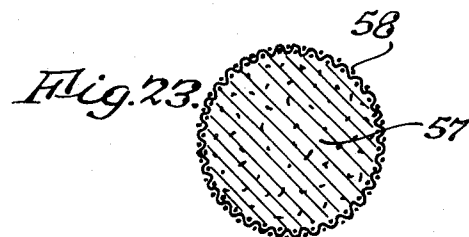
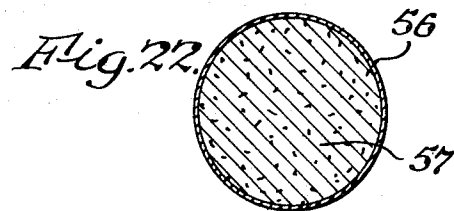
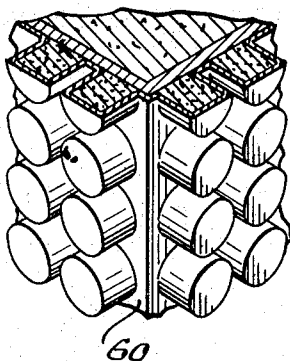
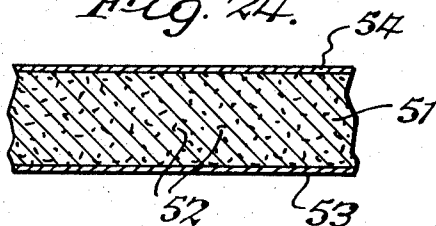


Fig. 24.



INVENTOR.
Ignatius T. Agro & Louis L. Chiusolo

BY

Joseph P. Gastel
ATTORNEY.

1

3,561,177

BUILDING COMPONENT

Ignatius T. Agro, Buffalo, and Louis L. Chiusolo, Amherst, N.Y., assignors of one-third to Charles A. Casaro, Buffalo, N.Y.

Filed July 16, 1968, Ser. No. 745,302

Int. Cl. B32b 3/12; E02d 19/18

U.S. Cl. 52—173

14 Claims

ABSTRACT OF THE DISCLOSURE

A laminated building panel for maintaining a water barrier compound in position against a structure which is to be waterproofed including a member providing a plurality of adjacent compartments extending in a plurality of directions, a water barrier compound in each of the compartments, a flexible backing layer covering the rear of said compartments and being water impervious and abrasion resistant, and a flexible facing layer for placement in contiguous relationship with a structure to be waterproofed, the facing layer being porous to permit penetration of water into the compartments for activating the water barrier compound.

BACKGROUND OF THE INVENTION

The present invention relates to an improved building component in the form of a laminate for providing a water barrier action.

Various types of water barrier laminates have been known in the past. One of these types included a rigid board-like member having parallel flute-like compartments therein which contained granulated bentonite clay with the entire board being formed of water permeable material to permit the water to enter the board and activate the clay. However, these boards were subject to the shortcoming that if they were ruptured in one location, the bentonite clay would drain out of the flutes. Other building components containing bentonite clay were rigid which made them difficult to handle in that they could not be formed into rolls for shipping and storage. It is with an improved building component which overcomes the foregoing shortcomings that the present invention is concerned.

SUMMARY OF THE INVENTION

It is accordingly one object of the present invention to provide an improved building component consisting of a laminate having individualized, closely spaced compartments therein for containing a water barrier compound to thereby provide independent pockets which will prevent spilling of the water barrier compound from large areas of the laminate in the event of rupture of a portion thereof.

Another object of the present invention is to provide an improved building component containing a water barrier compound which is relatively flexible so that it can be formed into rolls for shipping and storage.

A further object of the present invention is to provide an improved caulking strip containing a water barrier compound. Other objects and attendant advantages of the present invention will readily be perceived hereafter.

In certain forms of the present invention the improved building component consists of a plurality of compartments containing bentonite clay, a water impervious backing layer, and a water permeable facing layer, with flexible web portions connecting the various compartments to permit the component to be formed into rolls. Other embodiments contain individual compartments except that they are formed of a rigid material and are therefore not flexible. Still further embodiments of the present invention have insulating material forming a part of the laminate to provide insulation as well as a water barrier

2

action. The present invention will be more fully understood from the following portions of the specification when read in conjunction with the accompanying drawings wherein:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a fragmentary perspective view of the improved building component of the present invention having a first cup design mounted on the outside of a masonry or other type of wall;

FIG. 2 is a side elevational view of the building component of FIG. 1;

FIG. 3 is a view partially in cross section taken substantially along line 3—3 of FIG. 2;

FIG. 4 is a side elevational view of an alternate type of cup design which may be utilized for the building component;

FIG. 5 is a side elevational view of a still further alternate cup design which may be utilized in the building component;

FIG. 6 is a side elevational view of yet another alternate type of cup design which may be used;

FIG. 7 is a side elevational view of a further alternate design for the cups;

FIG. 8 is a fragmentary perspective view, partially broken away showing a further modification of the present invention;

FIG. 9 is a view partially in cross section taken substantially along line 9—9 of FIG. 8;

FIG. 10 is an enlarged view of a portion of FIG. 9;

FIG. 11 is a fragmentary perspective view of still another modification of the present invention;

FIG. 12 is a cross sectional view taken substantially along line 12—12 of FIG. 11;

FIG. 13 is a fragmentary perspective view of a rigid building component;

FIG. 14 is a cross sectional view taken substantially along line 14—14 of FIG. 13;

FIG. 15 is a fragmentary cross sectional view of an alternate type of building component which is similar to that shown in FIGS. 1 through 7 and which may encompass any of the cup shapes shown therein but which utilizes a foamed plastic face layer to provide insulation;

FIG. 16 is a fragmentary perspective view of a still further alternate embodiment of the present invention utilizing an expanded foam base which is impregnated with bentonite clay particles;

FIG. 17 is a cross sectional view taken substantially along line 17—17 of FIG. 16;

FIG. 18 is a side elevational view of a bentonite clay caulking strip;

FIG. 19 is a cross sectional view taken substantially along line 19—19 of FIG. 18 for showing the construction of the caulking strip;

FIG. 20 is a cross sectional view similar to FIG. 19 but showing an alternate cross sectional configuration of the caulking strip;

FIG. 21 is a fragmentary perspective view of a building component configuration which may be used for mounting on corners of structures;

FIG. 22 is a cross sectional view similar to FIG. 19 but showing an alternate construction for the caulking strip;

FIG. 23 is a cross sectional view similar to FIG. 22 but showing a still further alternate construction for the caulking strip; and

FIG. 24 is a cross sectional view similar to FIG. 17 but showing a modification thereof.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

In FIGS. 1, 2 and 3 a preferred embodiment of the present invention is disclosed. In this embodiment a ma-

sonry wall 10 is shown having the improved building component 11 thereof mounted thereon. Building component 11 is fabricated from a base or backing layer 12 having cups 13 formed therein which contain particles 14 of bentonite clay, which functions as a water barrier, in the well known manner, when subjected to wetting. The cups 13 are covered by a porous facing layer 15 which permits the water to reach the bentonite clay in cups 14 to expand said clay and thus activate the water barrier action. The laminated building component 11 is secured to wall 10 by means of any suitable mastic or cement.

In its more specific aspects the cupped base or backing layer 12 is formed from a suitable plastic material which has been formed into its cupped configuration in any suitable manner, as by vacuum forming or die forming. Backing layer 12 is impervious to water and is also insoluble in water. In addition it is highly abrasion resistant so that when the masonry wall 10 is back-filled, the dirt will not tear the building component 11. Base 12 may be fabricated from polyethylene or expanded polystyrene or any other suitable polyester film which will give the desired water impervious and abrasion resistant characteristics. In addition, as will appear hereafter, backing layer 12 is flexible so that the building component can be rolled for shipping and storage, thereby facilitating the ease with which it can be handled.

As can be seen best from FIGS. 2 and 3, cups 13 are staggered so as to provide a minimum spacing therebetween in the web portions 16 which are located between adjacent cups 13. At this point it is to be noted that each cup 13 includes a base or backing layer wall 17 and a side wall 18. When the building component 11 is in position against a basement wall, the dirt will tend to work in to the spaces between walls 18 of adjacent cups and thereby tend to hold said building component firmly in position.

Each cup 13 is filled with granular bentonite clay. Bentonite clay having a particle size of approximately 325 U.S. mesh has been utilized effectively and it is possible to utilize clay falling within a size range of between 4 mesh and 600 mesh depending on the application. The bentonite clay which has been used is of the type mined at Upton, Wyo. and Belle Fourche, S. Dak. by the American Colloid Company. These clays are obtainable under the trademark Volclay of the American Colloid Company. In addition, bentonite clay which is mined at Panther Creek, Miss. can also be used, especially in applications where a minimum of swelling can be tolerated since the Panther Creek bentonite clay is of the nonswelling type, whereas the other clays mentioned above are of the swelling type.

The facing layer 15 is secured to the web portion 16 of backing layer 12 by any suitable adhesive. The facing layer 15 is any type of absorbent paper, such as the type commonly called asbestos paper. Facing layer 15 may also be any suitable fabric or any plastic which will permit penetration of water for activating the bentonite clay in cups 13. It will be appreciated that whenever there is water seepage or the existence of water between wall 10 and building components 11, this water can penetrate facing layer 15, wet the bentonite clay in cups 13 and thus cause it to swell and provide its water barrier action. Any other type of permeable paper or cardboard or nonwoven bonded fabric may be used as facing layer 15.

By virtue of the fact that individual cups are provided in backing layer 12, the bentonite clay 14 will be held at fixed locations in the building component. Thus, as the bentonite clay swells and shrinks due to wetting and drying, respectively, it cannot move away from the place in which it was originally placed, as was the case with previous constructions which did utilize individual cups or compartments. Furthermore, in the event that a building component 11 should be torn in a specific area incidental to installation or back filling, the only loss of bentonite clay therefrom would be from the part which was actually torn. The bentonite clay granules would not drain from

the sheet as was the case with previous constructions which did not utilize separate compartments for the bentonite clay, as shown in FIGS. 1 to 3.

One great advantage of the present construction shown in FIGS. 1 to 3 is its flexibility and therefore the building component 11 can be rolled for shipping and storage and be unrolled for use. In this respect it is to be noted that the areas at webs 16 which are in contiguous relationship to facing layer 15, provide locations of extreme flexibility. It can be seen from FIG. 2 that these areas 16 of extreme flexibility lie in horizontal lines and thus it is very easy to roll the building component 11 by flexing it along these lines with the cups 13 lying on the outside of the roll and the facing 15 on the inside. During such rolling the bentonite granules 14 will be held in their compartments.

In FIGS. 4 through 7 alternate cup configurations are shown for the backing layers. However, it will be appreciated that the filling of bentonite clay and the facing layers are identical to that described above relative to FIGS. 1 to 3 and therefore this will not be repeated at the present time. It will also be appreciated that in these embodiments the backing layers may be fabricated from any suitable material such as described above relative to FIGS. 1 to 3. The only difference between the backing layers of these figures and FIGS. 1 to 3 resides in the shape of the cups themselves. More specifically, in FIG. 4 the cups 20 are of triangular shape and are separated by webs 21. The advantage of this particular construction is that the webs can be relatively narrow to permit each square unit of building component to carry more bentonite clay across its surface. In FIG. 5 another configuration is shown wherein cups 22 are square and are separated by webs 23. While cups 22 are shown as being in alignment both in a horizontal and vertical direction, it will be appreciated that they can be staggered relative to each other so that each cup lies below the web between the cups immediately above it. In FIG. 6 another configuration is shown wherein cups 24 are hexagonal and are separated by web portions 25 of the backing. In FIG. 7 a still further configuration is shown wherein cups 26 are generally elliptical and are separated by webs 27. Cups 26 are shown as being staggered to minimize the web area between them.

In FIGS. 8, 9 and 10 another embodiment of the present invention is shown. The building component 30 consists of a central screen grid 31 which is fabricated from crossed strands of plastic 32 which are bonded to each other by a suitable sealing procedure. As can be seen from FIG. 10, plastic strands 32 are of a width which extends completely between backing layer 33 and facing layer 34. However, at the point 35 at which the strands cross each other, they become reduced in cross section so as to permit said strands to cross each other without causing bumps or increasing the thickness of the screen beyond the thickness of the original strands 32. The backing layer 33 is any suitable plastic which is heat sealed or otherwise suitably secured to one side of screen 31 at edge portions 36 of strands 32. It will be appreciated from FIG. 10 that by effecting such joinder between backing layer 33 and screen 31 pockets 37 are formed which are filled with bentonite clay of the type described in detail above. After such filling has been effected a facing layer 34 is suitably secured to the side of screen 31 which is opposite to backing layer 33. This can be accomplished by suitable adhesives or the like. Facing layer 34 is permeable and may be made of any of the material discussed in detail above relative to FIGS. 1 to 3. The embodiment of FIGS. 8 through 10 provides extreme flexibility because the core screen 31 and both the backing and facing layers are extremely flexible. In addition, the crossing of strands 31 provides the desired pockets for retaining the bentonite clay in position within the building component. In use, the absorbent facing layer 34 is placed up against the wall and secured thereto by suitable cement.

5

In FIGS. 11 and 12 a still further embodiment of the present invention is shown which consists of a rigid core 38 of honeycomb configuration which can be fabricated from suitable paper or plastic. The pockets formed by the honeycomb structure are filled with bentonite clay granules 39 which may be of the same size, type and description as described above in detail relative to FIGS. 1 to 3. In addition, a nonpermeable backing layer 40 of suitable sheet plastic or the like is suitably bonded to the first side of the honeycomb structure and a permeable facing layer 41 of a suitable material is bonded to the opposite side. The backing and facing layers may consist of the materials described in detail above relative to FIGS. 1 to 3.

In FIGS. 13 and 14 a still further embodiment of the present invention is shown. This embodiment consists of a core 42 which is a rigid plastic gridwork containing pockets 43 which are filled with bentonite clay granules 44 of the same size, shape and description as discussed above relative to FIGS. 1 to 3. In addition, a water impervious backing layer 45 is secured to one side of the gridwork and a water pervious facing layer 46 is secured to the other side. The grid 42 may be fabricated from suitable molded plastic or any other material while the facing layer 46 and backing layer 45 may be identical to those described above relative to FIGS. 1 to 3.

In FIG. 15 still another embodiment of the present invention is disclosed. This embodiment includes a backing layer 47 which may be identical in all respects to the embodiment shown in FIGS. 1 to 3 and the cups 48 thereof may be of any of the shapes shown in FIGS. 4 through 7. However, the facing layer which covers the cups which contain the bentonite granules 49 in position is fabricated from a foamed, porous product such as expanded polyurethane foam 50 which permits the water to reach the bentonite granules 49. In addition, the foamed porous product 50 provides added insulation.

In FIGS. 16 and 17 a still further embodiment of the present invention is shown. This embodiment includes a layer 51 of expanded polyurethane foam or any other foam having connected air cells therein. Impregnated in these cells are bentonite clay granules 52 of any suitable size within the ranges discussed above relative to FIGS. 1 to 3. In addition, a backing layer 53 of any suitable liquid impervious plastic is secured to the core 51. The bentonite granules 52 can be impregnated into foam 51 by passing both the foam and the granules under rollers which force the granules into the foam or by pulling the granules in by vacuum applied to the side opposite to which the granules are placed. In FIG. 24 a modification of FIGS. 16 and 17 is shown which is identical in all respects, except that a facing layer 54 is provided of water permeable material of any type such as discussed above relative to FIGS. 1 to 3 which will permit water to wet the granules 52 to expand them. The water permeable membrane 54 covers the foamed material 51 so that the bentonite clay cannot be lost therefrom. These embodiments are flexible for ease in handling and storage.

In FIGS. 18 through 23 an improved caulking strip containing bentonite clay is shown for placement within joints or the like which are to be waterproofed. This caulking 55 includes an outer continuous casing 56 which is water soluble and will dissolve, but while dry will not permit the core of bentonite granules 57 to be lost, as during storage. A liner 58 of a suitable mesh fabric material is located within casing 56 to hold the granules 57 in place after casing 56 has dissolved after having been installed. The bentonite clay may be of any of the sizes mentioned above relative to FIGS. 1 to 3. Casing 56 may be fabricated from polyvinyl alcohol which is water soluble.

In FIG. 20 a different shape of caulking is shown which is identical in all respects to that shown in FIG. 19 except that the embodiment of FIG. 20 is of triangular shape. This caulking is used at abrupt joints as where two walls meet. In FIG. 22 a still further embodiment of

6

the present invention is shown which includes a core of bentonite granules 57 within the specified size range noted above relative to the other figures and an outer casing 56 which is identical to that of FIGS. 19 and 20. However, the mesh material 58 has been eliminated. In FIG. 23 a still further embodiment and modification of FIG. 22 is shown having a bentonite granule core 57 and a mesh casing 58. The outer water soluble casing has been eliminated. In all of the embodiments shown in FIGS. 18 through 23 it is merely necessary to place the caulking in position at a joint to be sealed and when the bentonite granules 57 are exposed to water they will swell to provide desired water barrier action. As noted above relative to FIGS. 19 and 20, the outer casing 56 will prevent loss of the bentonite granules, but upon dissolution will permit the water to reach the granules when the caulking is in place. With the embodiment of FIG. 23 certain amount of the dust from the bentonite granules can be lost prior to placement in position. However, this loss is minimal.

In FIG. 21 a still further embodiment of the present invention is shown wherein a building component is in the shape of an angle 60 for placement on the corner of a wall to prevent leakage. This angle is generally placed over the corner of a building wall. The construction of the cups, the size of the bentonite granules and the material of the facing layer may be identical in all respects to that described above relative to FIGS. 1 through 7.

We claim:

1. A building component for maintaining a water barrier compound in position against a structure which is to be waterproofed comprising a grid work of compartments which are adjacent to each other with said grid work including a plurality of said compartments extending in the first direction and a plurality of said compartments extending in a second direction which is transverse to said first direction to provide an overall pattern of compartments, each of said compartments having lateral wall means and first and second opposite ends, a water barrier compound in each of said compartments, a backing layer closing said first ends of said compartments for placement away from said structure with said water-barrier compound therebetween, a water-permeable facing layer covering said second ends of said compartments for placement in contiguous relationship to said structure and between said water-barrier compound and said structure to admit water to said compartments to activate said water-barrier compound for preventing leaking of water into said structure.

2. A building component as set forth in claim 1 wherein said lateral wall means and said backing layer are formed integrally to cause said compartments to be separate cup-like depressions for containing said water-barrier compound and wherein said lateral wall means are connected by flexible webs at a location remote from said backing layer to permit spaces to exist between adjacent lateral wall means of adjacent compartments and to permit said component to be formed into rolls.

3. A building component as set forth in claim 2 wherein said facing layer is a foamed porous plastic.

4. A building component as set forth in claim 2 wherein said facing layer is secured to said webs.

5. A building component as set forth in claim 4 wherein said backing layer and said lateral wall means are formed of abrasion-resistant plastic material.

6. A building component as set forth in claim 5 wherein said backing layer and lateral wall means are fabricated from an integral piece of formed plastic.

7. A building component as set forth in claim 1 wherein said lateral walls are formed from a screen-grid and wherein said backing layer and said facing layer are separate sheets which are secured to opposite sides of said grid.

7

8. A building component as set forth in claim 7 wherein said screen-grid is flexible in a direction toward and away from said backing and facing layers and wherein said backing layer is a flexible plastic sheet which is bonded thereto to cause said entire building component to be flexible.

9. A building component as set forth in claim 1 which is in the form of an angle for mounting on the corner of a structure.

10. A building component as set forth in claim 1 wherein said facing layer is a foamed porous plastic.

11. A building component for maintaining a water-barrier compound in position against a structure comprising a foam layer having interconnected cells for placement against said structure, a granular water-barrier compound impregnated in said cells, and a backing layer attached to said foam layer.

12. A building component as set forth in claim 11 wherein said backing layer is an abrasion-resistant plastic bonded to said foam layer.

13. A building component as set forth in claim 12 including an absorbent facing layer secured to the opposite side of said foamed material from said backing layer.

14. A caulking component comprising an elongated flexible tubular shell and a flexible filler of water-barrier

8

material therein, said tubular shell being a multi-ply layer with a first layer of water-soluble material which will dissolve on exposure to water but will not permit said water-barrier material to pass therethrough when dry, and a second layer of porous material of a mesh size which will permit water to pass therethrough but will tend to hold said water-barrier material in position after said first layer has dissolved.

References Cited

UNITED STATES PATENTS

2,222,815	11/1940	Johnson	161—162X
2,750,027	6/1956	Cummings	206—.5
2,277,286	3/1942	Bechtner	52—169X
2,744,042	5/1956	Pace	52—309X
2,898,760	8/1959	Pebbley	52—169X
3,084,403	4/1963	Elmendorf	161—122
3,186,896	6/1965	Clem	161—133
3,407,592	10/1968	Cassidy	52—169
3,445,322	5/1969	Saiia et al.	52—169X

PRICE C. FAW, JR., Primary Examiner

U.S. Cl. X.R.

52—169, 309; 161—68, 69, 122, 160, 174