May 27, 1969 W. T. MULLEN 3,446,340

CAULKING STRIP

Filed June 30, 1967 Sheet 1 of 2

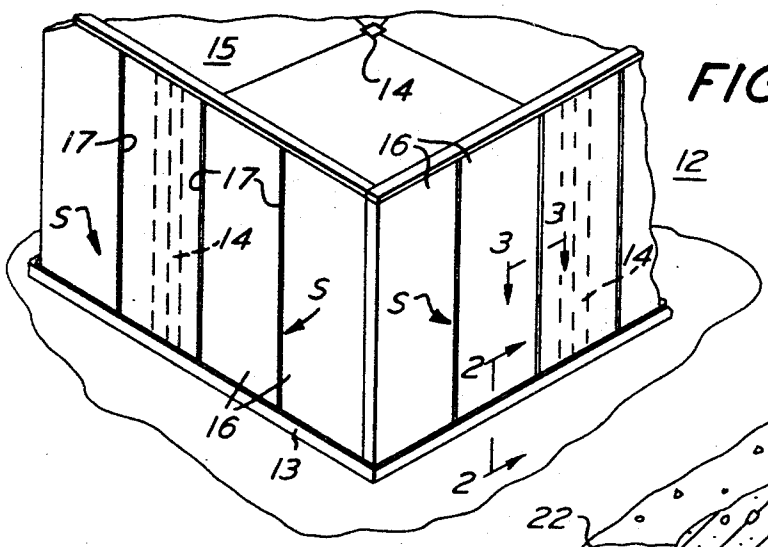

FIG. 1

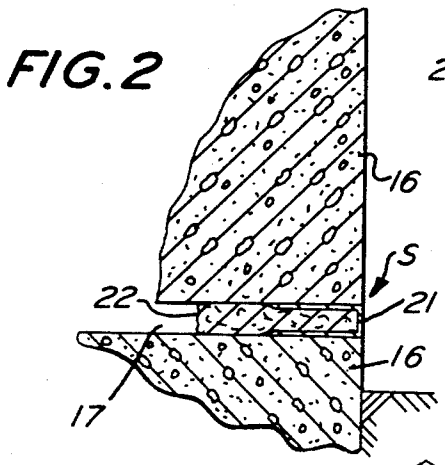

FIG. 2

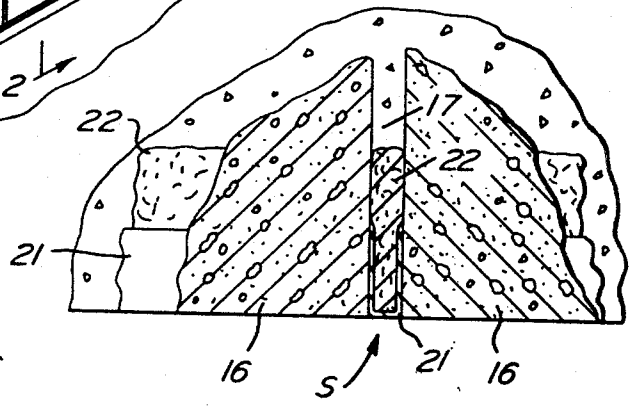

FIG. 3

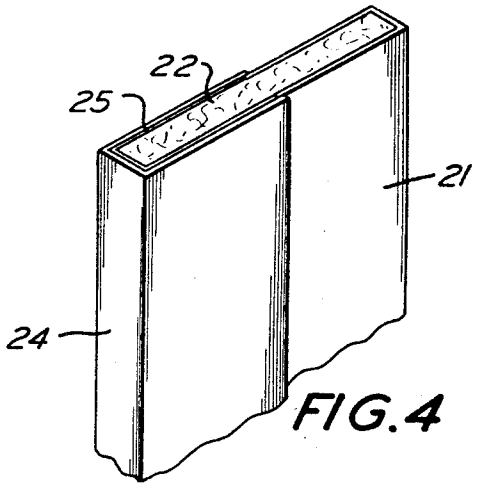

FIG. 4

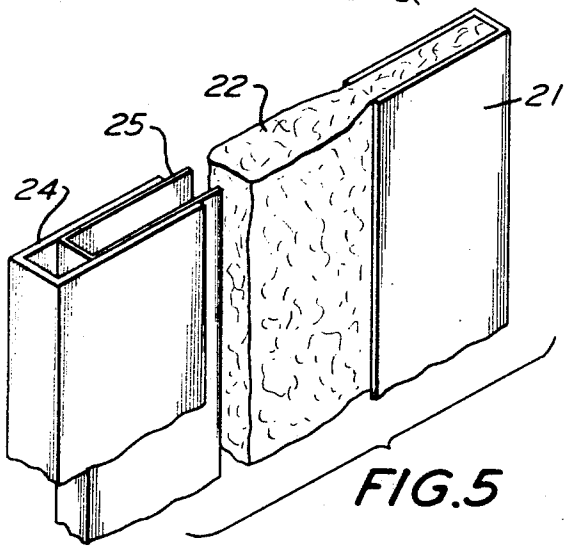

FIG. 5

INVENTOR
WILLIAM T. MULLEN
BY B. T. Wolverton
ATTORNEY

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FIG. 6

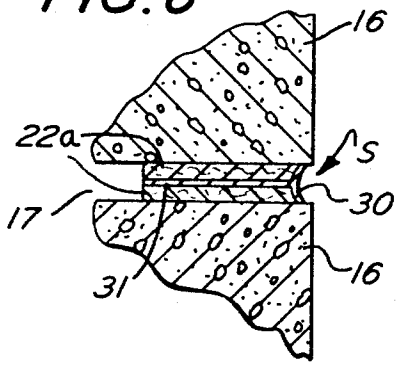


FIG. 7

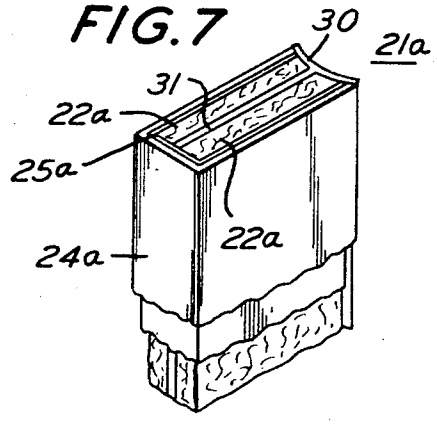


FIG. 8

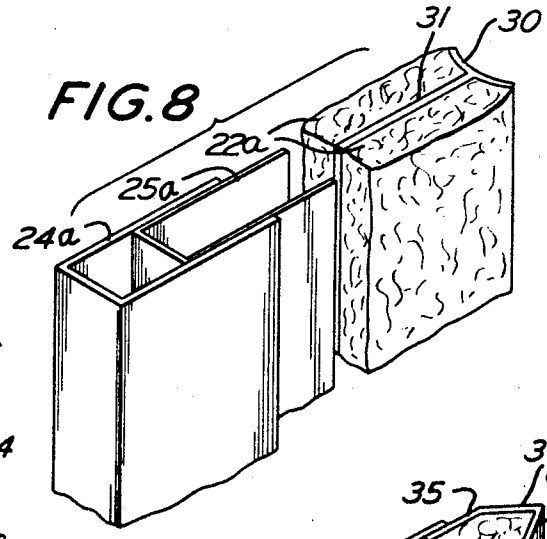


FIG. 9

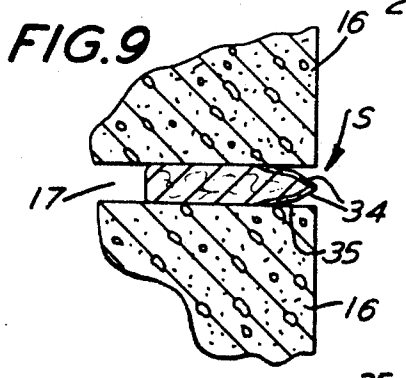


FIG. 10

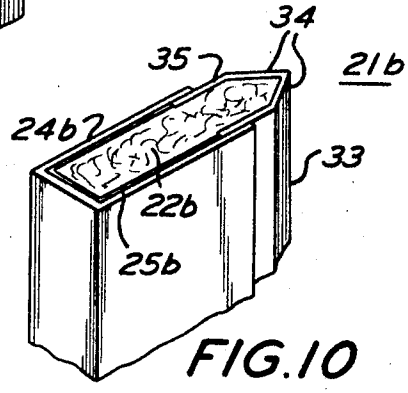
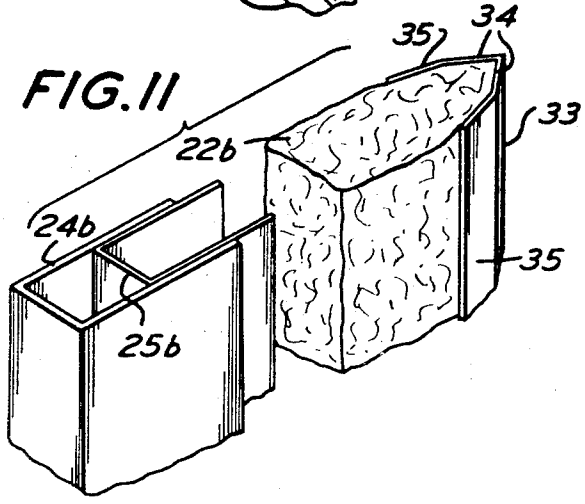


FIG. 11



INVENTOR

WILLIAM T. MULLEN

BY W. T. Wobensmith 3rd

ATTORNEYS.

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3,446,340

CAULKING STRIP

William T. Mullen, % William T. Mullen, Inc.,
3133 N. Broad St., Philadelphia, Pa. 19132

Filed June 30, 1967, Ser. No. 650,456
Int. Cl. B65d 85/00
U.S. Cl. 206—46 10 Claims

ABSTRACT OF THE DISCLOSURE

A caulking strip for filling the gaps, horizontal and/or vertical, between panels which strip has an outer finished surface portion and a precompressed slow expansion inner sealing strip portion and which is inserted in the gap for expansion to seal.

BACKGROUND OF THE INVENTION

Field of the invention

This invention relates to a caulking strip for openings between or along the edges of panels and the like having an outer finished surface portion and an inner sealing strip portion.

Description of the prior art

In modern building construction there is a trend to provide a facing of a building which is non-load bearing and simply "curtains" the exterior of the building from the elements. Increasingly this facing is an assembly on the job site of prefabricated wall sections. These wall sections incorporate in one unit the structural wall, the exterior finish and often the interior finish of the building. These prefabricated wall units sometimes weigh many tons and are lifted by giant cranes and fastened to the framing with connections especially provided in the panels and the framing. It is obvious that the joints between these panels must be wide enough to permit ease of installation and that very close tolerances are not feasible.

The panels of the type referred to expand and contract with changes in atmospheric temperature and the sealing of the joints has created a difficult problem. The sealant must be able to compensate with expansion and contraction, and remain at all times a positive water seal. Two types of sealant are now being used, preformed gaskets and bulk type sealants. Most preformed gasket types of sealants have proven unsatisfactory because they cannot be compressed sufficiently to permit subsequent expansion to fully occupy variations in construction joint widths. Such gaskets are often used as a backup material that is then covered with a bulk type of sealant.

The bulk type of sealant heretofore employed has included oil base caulks, urethanes, acrylics, polysulphides and silicones, and many other compounds. They all must be "compounded" to give varying degrees of elasticity, workability, adhesion, tensile and tear strength, hardness and other characteristics. The bulk sealants are forced into a joint with a caulking gun or knife and permitted to cure or harden into a supposedly pliable form. The compounding of these various sealants leaves great opportunity for error and consequently defective material.

The installation of bulk sealants again incurs problems. One of the most troublesome arises because of the failure to observe the limit of the width to depth ratio of two to one. This limit is most important to alleviate strain on the sealant material. To handle this important consideration, a filler is usually inserted into the joint to a depth to prevent exceeding this ratio. If the filler be of an unsuitable material, such that it could siphon out some of the sealant additives, or not be firmly set in place to the correct depth, the filler can nullify its purpose and actually be harmful.

In addition, the joint opening, in most instances, must

be thoroughly cleansed, and if necessary sand blasted and wire brushed so as to remove all dust and dirt in order that the bulk sealant will grip effectively. All of these considerations in both the compounding of the sealant, and its installation, leave a large area for failure, which too often occurs.

It has also heretofore been proposed to employ open cell polyurethane saturated with asphalt and compressed to the extent required to prove a particular type seal. Such material, if compressed to about 50% of its original volume provides a dust seal, to 33⅓% provides an air seal, to 25% provides a weathertight seal, to 20% provides a vapor seal, and to 15% provides a vacuum seal and hydrostatic seal. This material, in use, has a tendency to bleed and the straining effect, particularly on limestone or light color precast concrete, has prevented its widespread acceptance.

SUMMARY OF THE INVENTION

In accordance with the present invention a caulking or sealing strip is provided which overcomes the shortcomings of the present methods and materials, permits the sealing of the joint to be done from the inside or outside of the building after the panel has been securely put in place, and minimizes field labor.

In accordance with the invention, also, a caulking strip or sealant is provided having as one component a core of an open cell polyurethane or a similar cellular material which while fully expanded is impregnated with a waterproofing and water repellant. The cellular material is then compressed to a fraction of its original thickness and inserted into a split cartridge of either plastic or metal so that it can be delivered to the jobsite in various lengths and thicknesses as required. One section of the cartridge which has a finished exterior remains in intimate engagement with the core and another or retaining section of the cartridge which is removed for use of the strip prior to use, preferably retains the core in compressed condition and may, in certain embodiments, also engage the other cartridge section.

The principal object of the present invention is to provide a caulking strip suitable for insertion in openings whether horizontal and/or vertical between panels, and that has a finished outer surface portion and an inner sealing portion.

A further object of the present invention is to provide a caulking strip of the character aforesaid which is self sealing.

A further object of the present invention is to provide a caulking strip which is suitable for use in openings of varying widths, and which can expand or contract with changing temperatures while still maintaining an effective seal.

A further object of the present invention is to provide a caulking strip that is simple to use and is of low cost.

A further object of the present invention is to provide a caulking strip with an outer surface portion which can be colored to match the color of the masonry as desired.

A further object of the present invention is to provide a caulking strip which can be safely stored and handled ready for use.

Other objects and advantageous features of the invention will be apparent from the description and claims.

BRIEF DESCRIPTION OF THE DRAWING

The nature and characteristic features of the invention will be more readily understood from the following description taken in connection with the accompanying drawings forming part thereof, in which:

FIGURE 1 is a perspective view of a portion of a

building of panel construction incorporating the present invention;

FIG. 2 is a vertical sectional view, taken approximately on the line 2—2 of FIG. 1 and showing one preferred embodiment of a caulking strip in accordance with the invention;

FIG. 3 is a horizontal sectional view, taken approximately on the line 3—3 of FIG. 1;

FIG. 4 is a fragmentary view in perspective illustrating the caulking strip of FIG. 2 with its retaining cartridge section or protective cover in place prior to use;

FIG. 5 is a view in perspective illustrating the caulking strip of FIG. 2 with one cartridge element or protective cover removed and with the sealing portion in expanded condition;

FIG. 6 is a view similar to FIG. 2 showing another embodiment of the invention;

FIG. 7 is a fragmentary view in perspective of the caulking strip of FIG. 6 with its retaining cartridge section in place prior to use;

FIG. 8 is a fragmentary view in perspective illustrating the removal of the retaining cartridge section;

FIG. 9 is a view similar to FIG. 2 showing another embodiment of the invention;

FIG. 10 is a fragmentary view in perspective of the caulking strip of FIG. 9 with its retaining cartridge section in place; and

FIG. 11 is a view in perspective of the caulking strip of FIG. 9 with its retaining cartridge section removed.

It should, of course, be understood that the description and drawings herein are illustrative merely, and that various modifications and changes can be made in the structure disclosed without departing from the spirit of the invention.

Like numerals refer to like parts throughout the several views.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now more particularly to the drawings and particularly FIG. 1 thereof, a portion of a building **12** of well known type is there illustrated for purposes of explanation and incorporating the present invention. The building **12** has a base **13** which may be a cast slab, vertical framing elements or columns **14** and horizontal framing elements such as floor plate **15**. The framing elements **14** and **15** are joined at the desired locations and form the structural skeleton of the building. Large panels **16** of cast stone or other cementitious material are provided to form the outer walls of the building, the panels being attached to the framing **14** and **15** in any well known manner (not shown).

The panels are merely illustrative as the invention is also applicable to other types of masonry, including limestone, marble, granite and precast masonry structures.

At the gaps or spaces **17** between the panels **16** caulking strips S in accordance with the invention are inserted and exteriorly, interiorly or both.

As shown more clearly in FIGS. 4 and 5, the caulking strip S there illustrated is comprised of a finished outer cover or binder strip **21** which may be of metal, such as aluminum or other material resistant to corrosion and free from discharge of staining residues. The strip **21** may be colored to match the panels **16** as desired and is preferably of U-shape in cross section. The binder strip **21** may also be of plastic, if desired, so long as it is of adequate strength, is resistant to weathering and is free from any tendency to discolor.

A soft highly compressed sealing strip **22** extends within and beyond the interior of the binder strip **21**. The strip **22** is preferably composed of an open cell polyurethane plastic or similar cellular material which in fully expanded condition is impregnated with a waterproofing and water repellent material which may also be adhesive. Asphalt is a suitable impregnant. The extent of compression after impregnation will be determined by the nature of the seal which is desired upon subsequent reexpansion.

As shown in FIGS. 4 and 5 a protective cover or retaining cartridge section **24** of U-shape in cross section is applied to the strip **22** when it is in compressed condition and with a release sheet **25** interposed to prevent adherence to the cover **24** but to retain the sealing strip **22** in compressed condition until used. The sheet **25** may be of paper or the like which is not adherent to the strip **22**. The cover **24** and release sheet **25** are removed immediately prior to use. The strip **22** is preferably compressed in the ratio of about 4 to 1 prior to insertion into the binder strip **21**, protective cover **24** and release sheet **25**.

The strip S may be supplied in any desired length and is suitable for use with panels of any height, such as 35 or more feet.

To install the strip S, the strip S is cut to desired length and the protective cover **24** and release sheet **25** are removed. The strip **22** is placed in the gap or space **17** between the panels **16** with the binder strip **21** on the outside and positioned flush with or inset from panel face, as desired, and before there has been any appreciable expansion of the strip **22**.

The strip **22** is then free to expand until it fills the gap **17** and grips the adjacent panels **16**, thereby effecting the desired seal.

The strip **22** may also be placed in the horizontal gaps or spaces **17** between the panels **16**.

Referring now more particularly to FIGS. 6, 7 and 8 in the embodiment of the invention there shown a cartridge section in the form of a cover or binder strip **21*a*** is provided with an elongated arcuate face portion **30**, preferably flexible, and with an elongated central plate **31** extending therefrom. Along each face of the plate **31** is a sealing strip **22*a***, similar to the strip **22** is provided, compressed as previously explained for later expansion in use.

A protective retaining cartridge section or cover **24*a*** and release sheet **25*a*** may be employed in a manner similar to the cover **24** and sheet **25** previously referred to, to hold the strips **22*a*** in compressed condition for shipping and until the caulking is to be effected.

The face portion **30** may be flexible so as to be concaved to a greater extent upon assembly to accommodate it to narrower gaps or spaces, or permitted to remain open to its maximum extent.

Referring now to FIGS. 9, 10 and 11, in the embodiment of the invention there shown a cartridge section in the form of a cover or binder strip **21*b*** is provided, colored or finished as desired and capable of a hinging action about an apex **33** so that side wall portions **34** and **35** may spread to the extent permitted by the gaps or spaces.

A protective retaining cartridge section or cover **24*b*** and release sheet **25*b*** may be employed similar to the cover **24** and sheet **25**. The cover **24*b*** is preferably in overlapped relation to the side wall portion **35** to the extent necessary to hold the strip **21*b*** in compressed condition until expansion is permitted by removal of the cover **24*b***.

If desired the strip S may also be used in other locations such as between horizontal panels in a concrete roadway bridge, or between floor panels in a building, or around exterior window and door components, along copings and cornices, along base cornices and in numerous other applications.

It will thus be seen that a caulking strip has been provided with which the objects of the invention are attained.

I claim:

1. A caulking strip for insertion in a space or gap along the edge of a building element to close the space and present a continuous outer finished face which comprises:

a smooth outer binder strip having a continuous outer face portion for transverse disposition within the space in exposed relation to the exterior, and

a compressible and expansible sealing strip in permanent engagement with said binder strip extending within and beyond the interior of the binder strip, said strip being expansible into gripping and holding relation in said space and in expanded condition holding said face portion in said exposed relaton.

2. A caulking strip as defined in claim 1 in which said binder strip is a channel.

3. A caulking strip as defined in claim 1 in which said binder strip has an arcuate face portion.

4. A caulking strip as defined in claim 1 in which said binder strip is a channel with an apex providing a hinge for spreading of said channel.

5. A caulking strip as defined in claim 1 in which said sealing strip is of an open cell plastic material.

6. A caulking strip as defined in claim 4 in which said sealing strip is impregnated with a water repellent materail.

7. A caulking strip as defined in claim 6 in which said last material is asphalt.

8. A caulking strip as defined in claim 1 in which:
said caulking strip is a cartridge, and
a protective cover cartridge section is provided in enclosing relation to the portions of said sealing strip outside said binder strip.

9. A caulking strip as defined in claim 8 in which said sealing strip is retained in compressed relation by said cover section.

10. A caulking strip as defined in claim 3 in which: said face portion has a plate extending therefrom, and said expansible strip is disposed on opposite faces of said plate.

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WILLIAM T. DIXSON, JR., *Primary Examiner.*

U.S. Cl. X.R.

52—403; 94—18.2