

[54] CONCRETE FORM LINER

[75] Inventor: Stephan S. Dashew, Los Angeles, Calif.

[73] Assignee: La Mesa Industries, Inc., Los Angeles, Calif.

[22] Filed: Dec. 10, 1971

[21] Appl. No.: 206,686

[52] U.S. Cl. 249/15, 249/99, 249/112, 249/192, 52/588, 264/35

[51] Int. Cl. E04g 11/08, B28b 7/00, E04g 9/08

[58] Field of Search 249/15, 112, 192, 249/98, 99, 176; 264/35; 52/588

[56] References Cited

UNITED STATES PATENTS

3,664,630	5/1972	Maynen et al.	249/112
3,485,000	12/1969	Fiquet.....	52/588 X
2,261,247	11/1941	Girard.....	249/112
3,085,367	4/1963	Ridder et al.	52/588 X
3,605,363	9/1971	Bard	52/588 X

Primary Examiner—Robert L. Spicer, Jr.
Attorney—Samuel Lindenberg et al.

[57]

ABSTRACT

A liner assembly for attaching to a structural concrete form to provide a desired texture to concrete walls and columns, including multiple form liner elements constructed to be snapped together and attached to the structural form. Each of the elements is trough shaped, with an inner wall and pair of side walls, one of the side walls having a flange with a first hook at its end, and the other side wall having a second hook and a retainer near the second hook. The form liner elements can be snapped together, with the first hook of one element retained between the second hook and retainer of another form liner element in an overlapping, interlocking connection, and the flanges of each of the elements can be nailed or otherwise fastened to the structural form. The interlocking elements allow an architect to vary the wall texture or pattern at selected areas, such as at doorways, and facilitates reuse of the liners because they can be taken apart and reassembled to any desired wall size, the interlocking feature preventing leakage of concrete between the liner elements.

4 Claims, 4 Drawing Figures

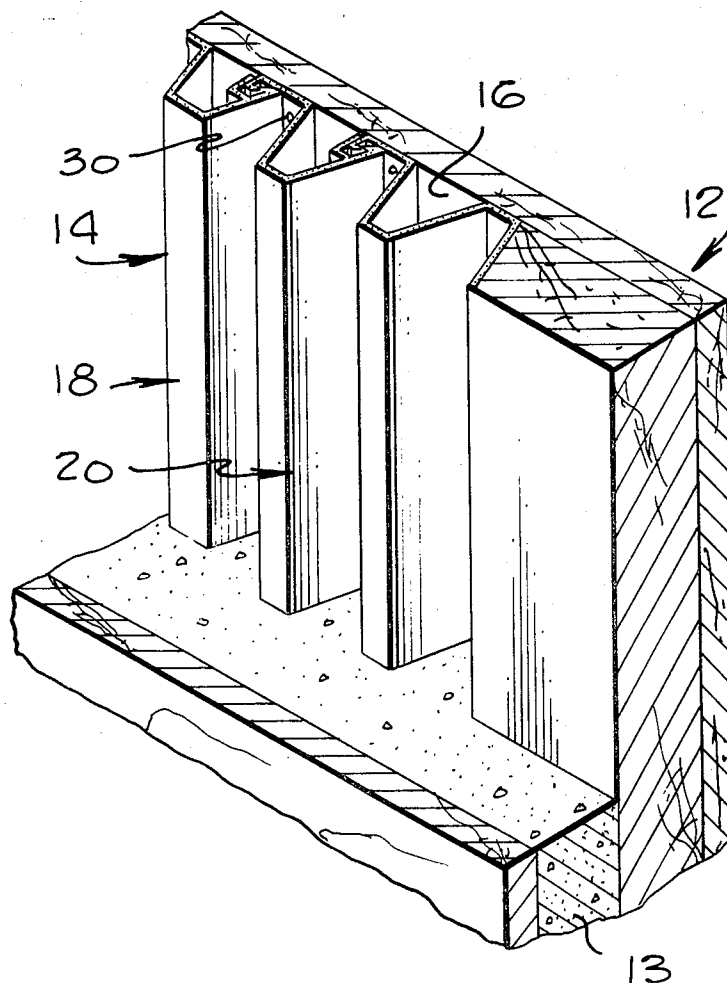


Fig. 1

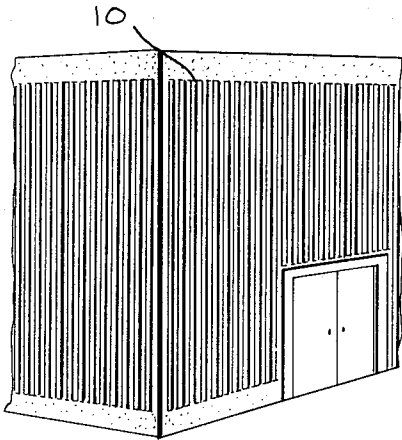


Fig. 2

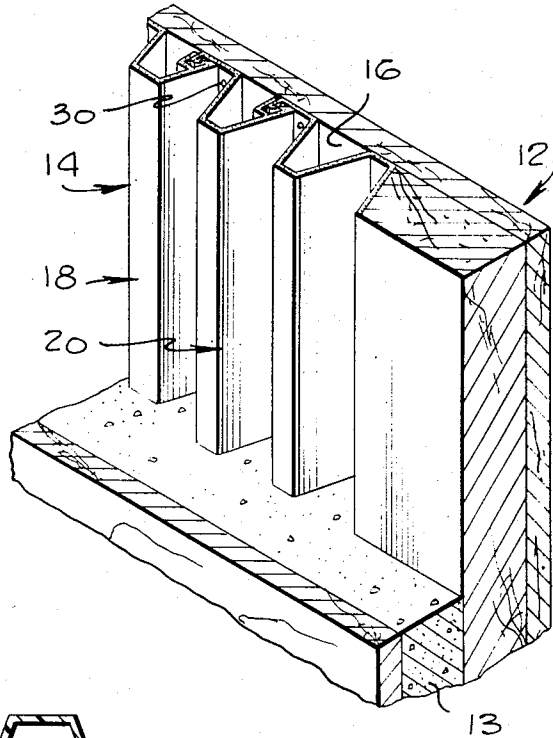


Fig. 3

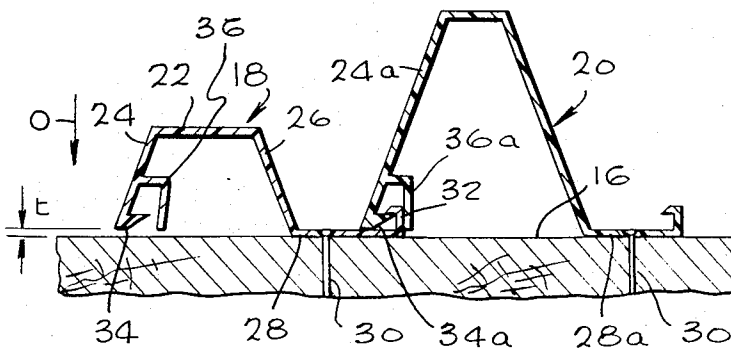
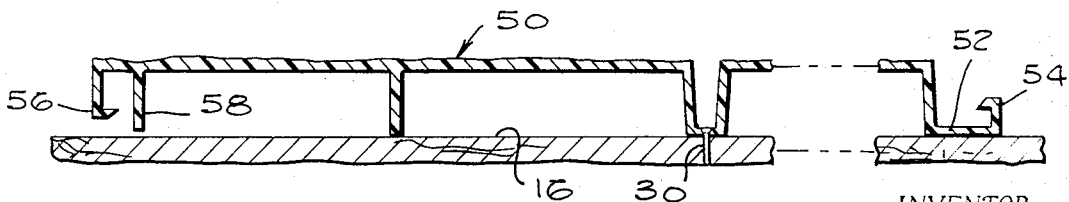


Fig. 4

INVENTOR.
STEPHEN S. DASHEW

BY

Lindenberg, Freilich & Wasserman
ATTORNEYS

CONCRETE FORM LINER**BACKGROUND OF THE INVENTION**

This invention relates to concrete forms, and more particularly to liner apparatus for attachment to concrete forms to provide a desired texture or pattern to finished concrete.

Exposed concrete surfaces, such as those of concrete walls and columns that are at the front of a building or in the lobby, are often provided with an attractive texture or pattern. This is accomplished by utilizing ordinary structural forms that hold in the concrete and withstand its weight, and by applying form liners to inner surfaces of structural form. Such form liners have often been fabricated as large sheets of plastic with corrugations or other patterns, and the sheets have been fastened by nails or the like to the structural form. Where standard form liner sheets are employed, many of such sheets may be utilized, and some of them may have to be cut to fit into the area of concrete to be patterned. Special efforts must be taken to seal the regions where adjacent sheets abut one another to prevent the leakage of concrete between them.

After the form liner sheets are used, they can be removed and reused. However, it is often difficult to reuse those sheets which have been cut to size because the installation of a patchwork of sheet sections may result in considerable additional labor in sealing the edges where the sheet sections abut. Architects are sometimes reluctant to specify changes of texture at selected regions, such as at doorways, because a change in texture along a limited region can result in the need for considerable cutting of sheets and sealing of their edges. Form liner apparatus that reduced the amount of cutting to size and the amount of edge sealing, and which enabled the maximum reuse of the liners, would reduce the cost of constructing decorative concrete and provide architects with greater latitude in design.

SUMMARY OF THE INVENTION

In accordance with one embodiment of the present invention, form liner apparatus is provided which facilitates the fabrication of complete concrete forms, particularly where a variety of different patterns and textures are utilized, and which enables the greater reuse of the liner apparatus. The form liner apparatus includes numerous form liner elements that are designed to be readily snapped together in a manner that provides a leak-proof joint between elements. Each liner element has a trough shaped portion with an inner wall that lies spaced from the structural form and a pair of side walls that extend towards the structural form. A first of the side walls has a sidewardly extending flange fastened to the structural form and having a first hook at its end. A second of the side walls has a second hook extending towards the other side wall and has a retainer lying near the second hook. The elements are assembled by snapping the first hook of one liner element between the second hook and retainer of another liner element in an overlapping, interlocking connection, the interlocking hooks and retainer serving to hold the elements tightly together so that concrete cannot leak into the space between them.

The flanges of the liner elements are fixed to the structural form by nails or screws that can be later removed. After concrete is poured and sets, the structural form with the liner elements thereon can be re-

moved from the concrete and the elements can be removed from the structural form and from each other. The fact that each of the liners has only a small width, sometimes being only one corrugation wide, as compared to previous sheet-like liners, means that there is a minimum of cutting to size and therefore that the liner elements can be readily reused. The fact that the elements can be readily snapped together means that the building up of a form liner apparatus to the desired size can be readily accomplished. Provisions can be readily made for changes in the texture and pattern of the finished concrete at selected regions, by using liner elements that define different textures or patterns.

The novel features of the invention are set forth with particularity in the appended claims. The invention will be best understood from the following description when read in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a partial prospective view of a building with a textured concrete wall constructed in accordance with the invention;

FIG. 2 is a partial prospective view of a form assembly for constructing the building of FIG. 1, showing the structural form and a plurality of form liner elements installed thereon, being used to form concrete;

FIG. 3 is a sectional end view of a pair of form liner elements of the apparatus of FIG. 2, showing the manner in which they can be snapped together; and

FIG. 4 is a sectional view of a form liner element constructed in accordance with another embodiment of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. 1 illustrates a building with a concrete wall region 10 that has a corrugation pattern thereon. FIG. 2 illustrates a form assembly that can be utilized to form the corrugation pattern, the assembly including a structural form 12 of thick wood sheets that may be held in place by various bracing members (not shown) to withstand the weight of poured concrete 13, and a form liner assembly 14 attached to an inner face 16 of the structural form. The form liner assembly defines the texture or pattern of the finished concrete.

The form liner assembly 14 includes a series of form liner elements such as those shown at 18 and 20 in FIG. 3, that can be easily snapped together to cover an extended area, and which can be readily snapped apart for storage after use. The elements 18 and 20 are similar except that element 18 does not extend as deeply and is not as wide at its inner wall 22. Otherwise, the elements are identical so that a description of one applies to the other. The element 18 is largely trough-shaped, with an inner or support wall 22 that lies spaced from the inner surface 16 of the structural form, and a pair of side walls 24, 26 that extend outwardly, that is, with a directional component parallel to the outward direction indicated by the arrow 0 towards the support surface 16. A first of the side walls 26 has a sidewardly extending flange 28 that extends from an outer end of the side wall in a direction away from the other side wall 24. The flange 28 can be fastened to the structural form 12 by a nail 30 or other detachable fastener means. A first hook 32 extending away from the support surface 16, is formed at an end of the flange 28.

The second side wall 24 of the form has a hook 34 at its end, which lies a distance t from the support surface 16, the hook 34 extending sidewardly toward the first side wall 26. An L-shaped retainer 36 is also provided which extends to a position spaced sidewardly from the second hook 34 on a side thereof nearest the first wall 26.

The form liners 18 and 20 are assembled by snapping the first hook 32 of the form 18 into a position where it is engaged with the second hook 34a of the element 20 and is held in the engaged position by the retainer 36a of the element 20. The form liner elements 18, 20 are constructed of a material which is at least partially resilient, such as resin-impregnated fiberglass or polyvinylchloride plastic, so that the retainer 36a can deflect while receiving the second hook 32, and the retainer 36a then resiliently holds the hook 32 between itself and the hook 34a. The spacing of the second hook 34a from the retainer 36a is small enough to assure such resilient holding. The engagement of the form liners provides a joint that prevents the leakage of concrete between the elements, and that does not appear as a joint, the portion at 34a overlaps the end of the flange 28 and the hook 34a interlocks the hook 32, so that an overlapping and interlocking connection is made.

The form liner elements can be assembled on the structural form 12 in a number of ways. One way is to install a first element such as element 18, fasten its flange 28 to the structural form by nails or the like, snap the second element 20 into place on the first element and attach its flange 28a to the structural form, and so forth. The elements can be constructed so that the undeflected distance t between the second hook of an element and the support surface 16 is slightly less than the thickness of a flange 28. When the elements are snapped together and installed on the structural form 12, the second wall such as wall 24a is pushed or deflected inwardly a slight amount sufficient to help assure sealing against the leakage of concrete between the flange 28 and the second hook 34a.

After the series of form liner elements are assembled on the structural form 12, concrete is poured into the form assembly and allowed to set. After the concrete sets at least partially, the form assembly is removed therefrom and the form liner elements are removed from the structural form and unsnapped from each other. The elements then can be stored for future use.

In fabricating the form liner assembly, it is necessary that the length of the form liners equal the length of the region to be patterned in the concrete. Accordingly, some of the form liner elements may have to be cut in size. However, less cutting is involved in the present invention where only the ends of elements have to be cut, than in those cases where sheets of material have to be cut which results in cutting being performed along the width as well as along the length. Furthermore, where elements are cut only in length, it is generally easier to reuse them, as compared to the case of sheets of form liner material that have been cut in width as well as length.

In fabricating a form liner assembly, it may be necessary to install two or more liner elements end-to-end to cover a very long region. This requires that sealing against concrete leakage be performed where the ends of the elements abut one another. However, this results in less sealing than is required in a case where the sides of abutting sheets must be sealed as well as their ends.

The utilization of numerous form liner elements that can be readily snapped together facilitates the creation of variety in the design of a concrete surface. All of the form liner elements of a series are constructed so that the hooks fit into the space between the second hook and retainer to other elements so that any of them can be snapped together. However, different types of elements of a series can have very different textures and can be utilized to create different patterns at different regions of a wall. It is economical to provide even small regions of a special pattern, such as around a window or doorway, by utilizing a few elements of the special pattern, which does not require cutting up of a large sheet.

Although the form liner elements can have elongated narrow shapes of constant cross-section, it is possible to utilize wide elements at selected regions. FIG. 4 illustrates a wider element 50 that can cover an extended area, and which still can be readily snapped to other form liner elements. The element 50 has a flange 52 and first hook 54 of a size that enables it to snap into other elements of a series, while the second hook 56 and retainer 58 of the element 50 enables it to readily capture the first hook of another form liner element. All form liner elements of the series have hooks of the same size to enable any element of the series to be snapped into engagement with any other element of the series.

Thus, the invention provides form liner apparatus which can be rapidly installed and removed from a structural concrete form, and which minimizes the amount of cutting and sealing of abutting joints, maximizes the reuse of the form liner apparatus, and facilitates the use of a variety of different surface patterns and textures. This is accomplished by the utilization of form liner elements with portions that can be readily snapped together and taken apart. Each of the elements has an inner wall and a pair of side walls, a first of the side walls having a flange for attachment to a structural form and a first hook at the end of the flange. The second side wall has a second hook at its end for capturing the first hook of another element in a joint that is tight against the seepage of concrete. A retainer near the second hook of each element assures the retention, between its second hook and retainer, of a first hook of another element. The form liner elements are of substantially constant cross section along their length, so that they can be fabricated by extrusion to enable their production at low cost.

Although particular embodiments of the invention have been described and illustrated herein, it is recognized that modifications and variations may readily occur to those skilled in the art and, consequently, it is intended that the claims be interpreted to cover such modifications and equivalents.

What is claimed is:

1. A concrete form comprising:

a structural form having a support surface for withstanding the pressure of poured concrete; and a plurality of form liner elements each element having at least one inner wall spaced from said support surface and first and second side walls extending from an inner wall of the element towards said support surface, said first side wall having a flange extending along and fastened facewise to said support surface and said flange having a first hooking member at its end extending away from said support sur-

5

face, the outer end of said second side wall spaced from said support surface and having a second hooking member thereon extending towards said first side wall, each of said elements also having a retainer with a portion spaced from said second hook on a side thereof to lie between said first and second side walls;

said elements arranged with the flange of a first of said elements extending between said support surface and the second side wall of a second of said elements, with the first hooking member of said first element engaged with the second hooking member of said second element in an overlapping, interlocking connection and with said first hooking member of said first element closely held between said second hooking member and retainer of said second element.

2. A concrete form comprising:

- a structural form having a support surface for withstanding the pressure of poured concrete; and
- a plurality of trough-shaped liner elements of substantially constant cross-section each having an inner wall spaced from said support surface and first and second outwardly extending side walls extending toward the support surface, said first side wall having a flange extending sidewardly along said support surface away from said second side wall and having a first hook at its end, and said second side wall having a second hook at its outer end extending towards said first side wall, the first hook on at least one of said elements engaging the second hook of another element in an overlapping, interlocking connection, said flange having a concrete-facing surface opposite the support surface, said concrete-facing surface being unobstructed the the other element so that the concrete-facing surface determines the location of the formed concrete, and said flange being fastened facewise to

6

the support surface so that the position of the flange is accurately fixed.

3. The concrete form described in claim 2 wherein: each of said trough-shaped elements has a retainer wall with a portion spaced from said second hook of the same element by a distance sufficient to maintain therebetween the first hook on another element.

4. A concrete form liner comprising:

a structural form having a liner-supporting surface; and

a plurality of trough-shaped elements of substantially constant cross-section each having an inner wall spaced from the liner-supporting surface and first and second side walls extending outwardly towards the liner-supporting surface,

the first side wall of each element having a flange extending sidewardly away from the second side wall, the flange being disposed facewise against the liner-supporting surface, and the flange having a first hook at its end,

the second side wall of each element having a second hook at its outer end extending towards said first side wall and engaged with the second hook of another element in an overlapping, interlocking connection;

each element also having a retainer wall with a portion spaced from the second hook of the same element by a distance sufficient to maintain therebetween the first hook on the other element;

the outer end of the second wall being spaced from the liner-supporting surface by a distance equal to the thickness of the flange and being sidewardly spaced from the first side wall of the other liner element so that the flange of the other element is uncovered and therefore can directly contact concrete poured within the assembly of form lines.

* * * * *

40

45

50

55

60

65