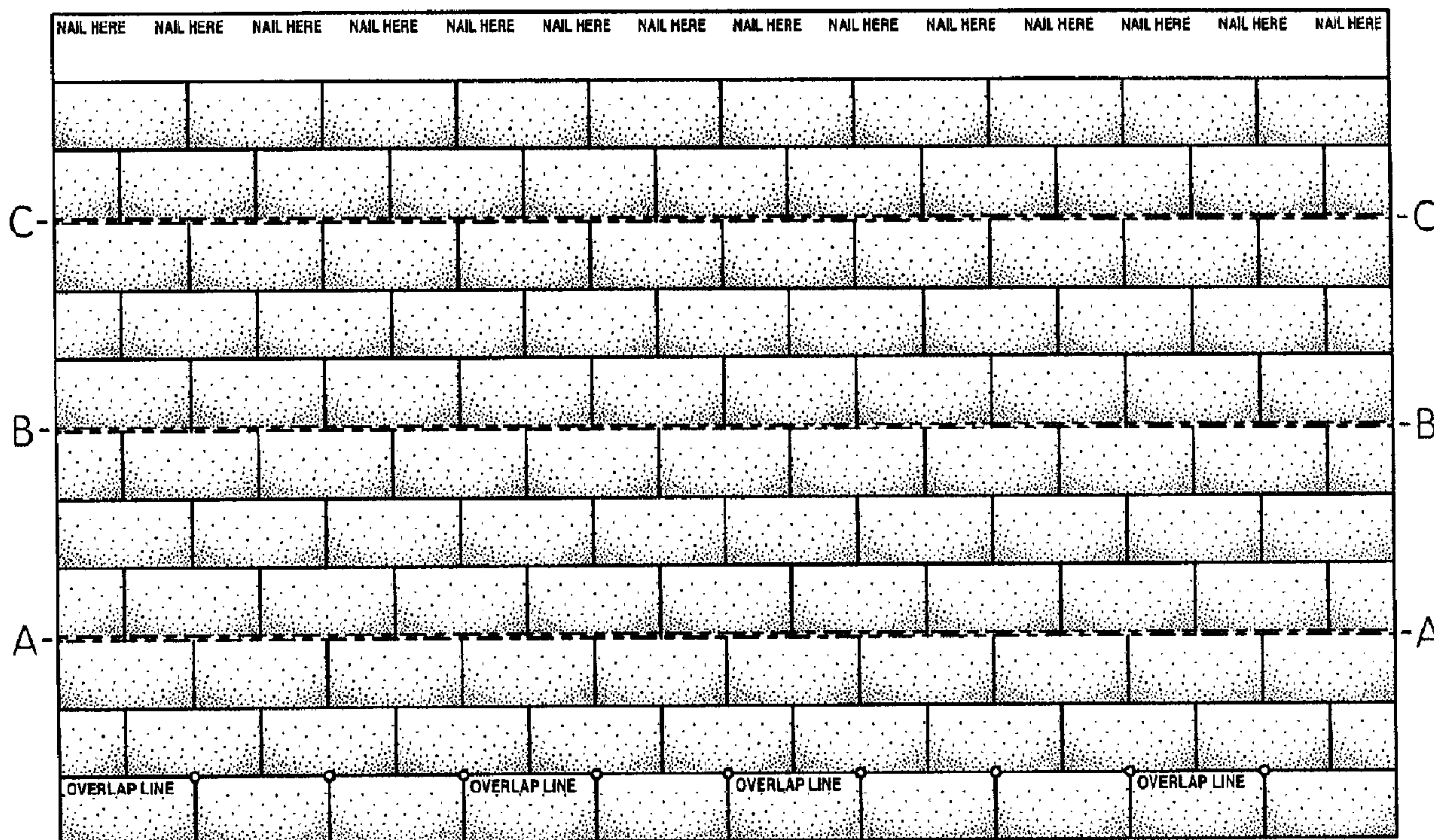




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(54) Title: ROOFING UNDERLAYMENT WITH ALIGNMENT INDICIA



(57) Abrégé/Abstract:

Indicia for placement of finish roofing material onto a printed underlayment. Such indicia are added on the underlayment to indicate where finish roofing material should be located and aligned. The indicia include markings on the printed underlayment which optically or tactily guide the location of finish roofing material applied over the printed underlayment.



ABSTRACT OF THE DISCLOSURE

Indicia for placement of finish roofing material onto a printed underlayment. Such indicia are added on the underlayment to indicate where finish roofing material
5 should be located and aligned. The indicia include markings on the printed underlayment which optically or tactily guide the location of finish roofing material applied over the printed underlayment.

ROOFING UNDERLAYMENT WITH ALIGNMENT INDICIA

BACKGROUND

5 This application is an improvement on the Patterned Roofing Underlayment disclosed in my United States Patent Application No. 12/705,749 filed February 15, 2010 which has been published as United States Patent Application Publication No. 2010/0212235 A1 dated August 26, 2010 (hereinafter "Published Application").

10 As explained in that application there is a need for an improved underlayment that would be a aesthetic and functional alternative to the typical "sea" of blue tarpaulins covering damaged roofing after a natural disaster or just pending replacement of shingles, tiles or other finish roofing material. The underlayment disclosed herein is an aesthetic improvement over monochromatic tarps discussed in the "Background" section of the Published Application, namely, a roofing
15 underlayment having a printed pattern on the underlayment to simulate the appearance of a finished roof.

20 The underlayment described in my Published Application has achieved considerable commercial acceptance in the marketplace for many of the reasons stated in my application, i.e., its outward appearance as a finished roof, its strength and light weight, especially versus typical felt or "tar" paper underlayment. However, this acceptance has been tempered by the absence of indicia thereon which installers might rely upon to align the finish roofing material for attachment to the roof.

25 One example of alignment indicia used in the installation of shingles, is found in the disclosure of U.S. Patent No. 3,763,609 issued October 9, 1973. It discloses rolls of roofing paper 5, such as bituminous felt paper, applied to a roof deck having spaced guide lines 6 and 8 extending longitudinally along the length of the roofing paper. These guide lines are used to align shingles for attachment to the underlying roof (column 3, lines 43-52). The guide lines are "visually distinct," meaning that the
30 guide lines 6 and 8 are of a strikingly different color from the background of the roofing paper (see column 2, lines 65 et seq of '609 Patent).

Another approach to providing visual alignment indicia for placement of shingles, slate, tiles, etc. on a roof is disclosed in U.S. Patent Application Publication No. 2005/0066593 A1 dated March 31, 2005. This published application notes the inefficiency of chalk lines and on-site measurements typically used to locate finish roofing materials for attachment to a roofing substrate [Paragraphs 0002-0003]. To
5 simplify installation of such roofing materials this application discloses at paragraph [0006] use of an “underlayment containing a grid [pattern] that is visually identifiable from above said underlayment when said underlayment is received over said roof substrate *** [for] assisting in the alignment of roofing materials applied over said
10 underlayment.”

SUMMARY

Such alignment indicia, however, are not compatible with the stated goal and appearance of the underlayment disclosed in my Published Application. That
15 underlayment projects an image of a finished roof for a period of time, typically up to six months. That image could be destroyed by distinct, “visually identifiable” guide lines or grid patterns overlying the printed pattern on my underlayment. With such lines and/or patterns one purpose of using a printed pattern on an underlayment
20 would be denigrated. No longer would the underlayment project an image of a finished roof. It would project an image of straight lines or grid patterns incompatible with the desired image of a finished roof.

To provide the designed combination of an attractive finished roof-like appearance while providing useful indicia for alignment of finished roofing materials
25 such as shingles, shakes, tiles, etc I have developed tactile alignment indicia for placement on an underlayment of the type disclosed in my Published Application.

In an illustrative embodiment, this tactile alignment indicia is designed to be readily incorporated into the initial process of making the underlayment so that the pattern can be printed over the indicia, thereby creating an uninterrupted pictorial representation of a finished roofing pattern, whether it be of shingles, slate, tile, etc. For example, horizontal alignment indicia on the underlayment (as viewed from the street level) can be added as the underlayment approaches the end of the manufacturing process by mechanically scoring at least one surface of the tacky, but not yet dry, underlayment to create subdued lines in that surface. Once dry, the pattern is printed on the underlayment.

In an illustrative embodiment, the scored alignment indicia on the underlayment are readily discernable by touch or sight by those workers on a roof a few feet from the underlayment but essentially unnoticed when viewed from street level. Thus, the goal of providing alignment indicia without adversely impacting on the finished roofing appearance of the underlayment is achieved.

Another form of tactile alignment indicia on the underlayment to be used with an illustrative embodiment includes a raised, versus scored, surface on the underlayment. The raised surfaces, or bumps, are preferably formed during manufacture before the pattern is printed on the underlayment. The raised surface indicia can be created by adding a yarn, monofilament or other material of sufficient dimension at appropriate intervals on the underlayment prior to completion of the underlayment structure.

Yet another form of alignment indicia may be incorporated into the printed pattern by adjusting the color and pattern of finish roofing material printed on the underlayment. It is possible to incorporate alignment indicia into the pattern which are readily apparent to workers on a roof but not to the casual viewer from the street.

Alignment indicia may be positioned on the underlayment at intervals corresponding to the upper edge of successive rows of the finish roofing material. Repeated lines corresponding to the spacing between roofing materials may be unobtrusively added on the underlayment.

In accordance with an illustrative embodiment, a lightweight roofing underlayment, for physical placement between a roof substrate and finish roofing

material, includes an upper surface, with a printed pattern thereon simulating the appearance of finish roofing material. The underlayment further includes a lower surface, and a reinforcement means located between the upper and lower surface. The upper surface also includes alignment indicia for placement of finish roofing material thereon. The indicia do not visually interfere the printed pattern when viewed from a distance of over 10 yards.

Other aspects and features of illustrative embodiments will become apparent to those ordinarily skilled in the art upon review of the following description of such embodiments in conjunction with the accompanying figures.

DESCRIPTION OF DRAWINGS

Fig. 1 illustrates the underlayment pattern disclosed in my Published Application.

Fig. 2 is a pictorial view depicting multiple rows of underlayment placed on a roof substrate with overlying shingles.

Fig. 3 is a flow diagram of a process useable to create the tactile alignment indicia in the underlayment during the manufacturing process.

Fig. 4 is an enlarged cross section through the underlayment illustrating a scored alignment indicia on one side of the underlayment surface.

Fig. 5 is one embodiment in which the alignment indicia are incorporated in the pattern(s) of the underlayment during its manufacture.

Fig. 6 is an enlarged cross section through the underlayment illustrating a raised alignment indicia on one side of the underlayment.

DETAILED DESCRIPTION

Figure 1 illustrates the roofing underlayment **10** described in my Published Application. This underlayment has an attractive appearance by itself when used as a temporary substitute for roofing materials as explained in my Published

Application. It is intended to be affixed to a roof under repair or replacement. The patterned roofing underlayment can also be used in new construction where appearance of a finished roof is desired, albeit only for a short period of time before finish roofing materials are applied. The underlayment shown in Fig. 1 has a printed pattern **16** replicating shingles. A typical roll of this lightweight underlayment **10** is rolled across a roof and nailed to the roof where it stays in position until finish roofing material, such as shingles, shakes, tiles, etc. is applied in anywhere from a few days to a few months. However, when it comes time to apply the finish roofing materials, the printed pattern **16** does not necessarily line up with the location of finish roofing materials to be applied over the underlayment **10**.

This lack of guidance on the underlayment **10** regarding the actual placement of the finish roofing material is a potential problem for less skilled workers applying finish roofing material. It has been found that the printed roofing pattern **16** can interfere with the workers' ability to properly position the finish roofing material onto the underlayment **10** before being nailed or otherwise affixed to the underlying roof substrate **60** as shown in Fig. 2.

To help such workers, spaced alignment indicia **30, 32, 34, 36, 38 and 40** are incorporated into the upper surface of underlayment **10** in a manner which is not readily apparent from a distance but can be readily discerned visually or tactily by the installer of the roofing material.

Visual alignment indicia that can be used to assist in alignment of final roofing material include subtleties in the arrangement of the pattern printed onto the underlayment which, when viewed at a short distance by the installer, indicates where the final roofing material should be placed. These visual indicia might include subtle solid, dashed, dot-dash lines or text material, e.g., "place top of shingle here", incorporated into the printed pattern that is perceptible only at a short distance from the underlayment.

Tactile alignment indicia useable in illustrative embodiments include alterations to the upper surface of the underlayment preferably during its manufacturing in the form of scored or raised surfaces on the underlayment **10**.

Figure 2 illustrates a typical installation of shingles on a roof substrate **60**. The roof typically has a lower edge with a fascia board applied to the ends of the rafters at the lower edge of the roof. To provide weatherproofing for this type of a roof, an underlayment **10** is typically applied in multiple rows over the roof substrate **60** starting at the bottom edge **42** of the substrate and proceeding towards the upper edge of the roof line (not shown). Typically, finish roofing material such as shingles are applied in rows **44-54** on top of the underlayment **10**, all as illustrated in Figure 2.

Spacing of shingles or like finish roofing material is important to the final appearance of the structure being worked on. The horizontal alignment of the finish roofing material, whether it be shingles, tiles, shakes, or other material, is typically achieved by laying out the position of the roofing materials by snapping a chalk line onto the underlayment or by visual sighting by the roofer. The first method has its problems of extra time associated with measuring off the chalk line in accurate horizontal lines properly spaced from each other. Visual sighting often produces uneven, wavering rows of finish roofing material. Thus, a simpler method of providing alignment indicia for the finish roofing material is a recognized need in the roofing industry.

A better substitute for chalk lines or visual sighting is provided by including alignment indicia **30-40** on the underlayment **10**. As noted above, such alignment in the past has been provided by highly visible lines drawn on the underlayment. Because those highly visible lines might detract from the printed pattern on the subject underlayment, other means of providing spacing and alignment of finish roofing materials is desired. Such means include strategically scoring or raising the surface of the underlayment prior to applying the printed pattern to the underlayment.

An example of a method to provide such scoring on the surface of the underlayment is illustrated in Fig. 3 which is a schematic diagram of a process that can be used in making the underlayment **10**. As shown in Fig. 3 the underlayment may be formed by depositing molten material, preferably a thermoplastic polyolefin, over or around a reinforcement mesh or scrim **62** with the thickness adjusted by

passing the molten material surrounding the mesh through rollers **64** and **66** as shown in Fig. 3. This reinforcement material **62** is preferably made from polypropylene tape as described in my Published Application. As deposited on and around the reinforcement material **62** the polyolefin is very hot and slowly cools as it passes through the rollers **64** and **66**, one of which may be a chilled roll. While still in a molten state, small troughs of varying cross-section can be applied along the surface of the underlayment **10** by rotating wheels **68** with contoured circumferences. These wheels are contoured to provide alignment indicia **14** on at least one surface (see Fig. 4).

Alignment indicia **14** scored into the surface of the underlayment **10** can be of any cross-section and depth sufficient to provide close-up visual and/or tactile information to the installer as to where to place the upper edge of the finish roofing material. Preferably when scoring, the surface of the underlayment is displaced by the scoring mechanism into an area above the normal surface of the underlayment to create a ridge having a height "H" (as shown in Fig. 4) of about 1-2 millimeters (0.04-0.08 inches) that provides an added tactile sensation for the installer that can be used to align the finished roofing materials on the underlayment **10**. Thus, the installer can, by feel, align the upper edge of the shingle, or other finish roofing material, with the scored line on the underlayment simply by tactile sensation. However, neither the depth of the score line or the material displaced when it is created is of such dimension that it visually interferes with the pattern printed on the underlayment when viewed from a distance of about 10 or more yards from the underlayment. The score lines formed in the underlayment are spaced such that the correspond to the upper edge of the finished roofing materials being applied to the underlayment (see Fig. 2).

Alternatively, a raised tactile surface on the underlayment can be provided by adding a yarn or monofilament **15** to the surface of underlayment as illustrated in Fig. 6. This yarn or monofilament is preferably added during production of the underlayment so that it is imbedded in the surface of the underlayment while the surface is still molten. The yarn or monofilament may also be incorporated into, or added with, the mesh **62** before molten polyolefin is applied over the mesh as

described above. This material embedded in the underlayment would preferably extend above the surface of the underlayment a distance "H" of 1-2 millimeters as shown in Fig. 6. As with the score line discussed above, this height "H" above the surface should not be of such a dimension that it visually interferes with the pattern printed on the underlayment when viewed from a distance of about 10 or more yards from the underlayment.

As shown in Fig. 2, several horizontal rolls of underlayment **10** have been attached to substrate **60**. To facilitate the following discussion the printed pattern on the underlayment is not shown in Fig. 2. Each roll has alignment indicia **30-40** on the upper surface of the underlayment **10** which are spaced to correspond to the location of upper edges of finish roofing material that would be applied over the underlayment, typically after a period of time as explained in my Published Application. The spacing of the alignment indicia **30-40**, of course, depends upon the type of finish roofing material being applied to the underlayment. As illustrated in Fig. 2, the finish roofing material are asphalt shingles which have installed upper edges that are offset from each other by approximately 12-13 inches. That offset corresponds to the spacing of the alignment indicia score in the underlayment as shown in Fig. 2. That spacing will vary according to the type of finish roofing material being used, which often depends on the geographic location of the roof being applied to the substrate **60**.

The alignment indicia can also be displayed on the underlayment as part of the pattern printed on the underlayment. In this embodiment of the invention, the alignment indicia A-C (Fig. 5) correspond to the horizontal lines in the pattern printed on the underlayment. In this embodiment the alignment indicia A-C comprise slightly different, wider lines in the horizontal lines of the pattern (see Fig. 5). These lines can be shown as dash, dots, dot-dash or contain subdued text, e.g., "Place top of shingle here" to further assist the installer. For purposes of illustration only, the spacing of alignment indicia in Fig. 5 corresponds to the distance between three rows of a printed pattern. Thus, if the printed pattern on the commercial embodiment of my invention has about 4 inches between rows of simulated shingles, and actual roofing shingles are spaced 12-13 inches apart, horizontal lines

A-C acting as alignment indicia are only included in every third row of the printed pattern. Those horizontal lines A-C in the pattern constituting alignment indicia are slightly darker and wider than other lines in the pattern, which difference is not generally noticeable from a distance, i.e., an observer at street level, but are readily
5 apparent to a roofer observing them close at hand when applying finished roofing materials.

THE SUBJECT-MATTER OF THE INVENTION FOR WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED IS DEFINED AS FOLLOWS:

1. A lightweight roofing underlayment for physical placement between a roof
5 substrate and finish roofing material, comprising,
an upper surface, with a printed pattern thereon simulating the appearance of
finish roofing material,
a lower surface,
a reinforcement means located between the upper and lower surface,
10 wherein the upper surface also includes alignment indicia for placement of
finish roofing material thereon which indicia do not visually interfere the printed
pattern when viewed from a distance of over 10 yards.
2. The roofing underlayment of claim 1 wherein the alignment indicia include
15 scored lines on the upper surface of the underlayment.
3. The roofing underlayment of claim 2 wherein the scored lines are formed in
the upper surface during production of the underlayment.
- 20 4. The roofing underlayment of claim 3 wherein the scored lines are formed by
physically displacing a portion of the upper surface while in a molten state during
production of the underlayment.
5. The roofing underlayment of claim 1 wherein the alignment indicia are
25 incorporated as part of the printed pattern.
6. The roofing underlayment of claim 1 wherein the alignment indicia are raised
lines in the upper surface of the underlayment.
- 30 7. The roofing underlayment of claim 6 wherein the raised lines are formed by
incorporating yarns or monofilament into the upper surface of the underlayment.

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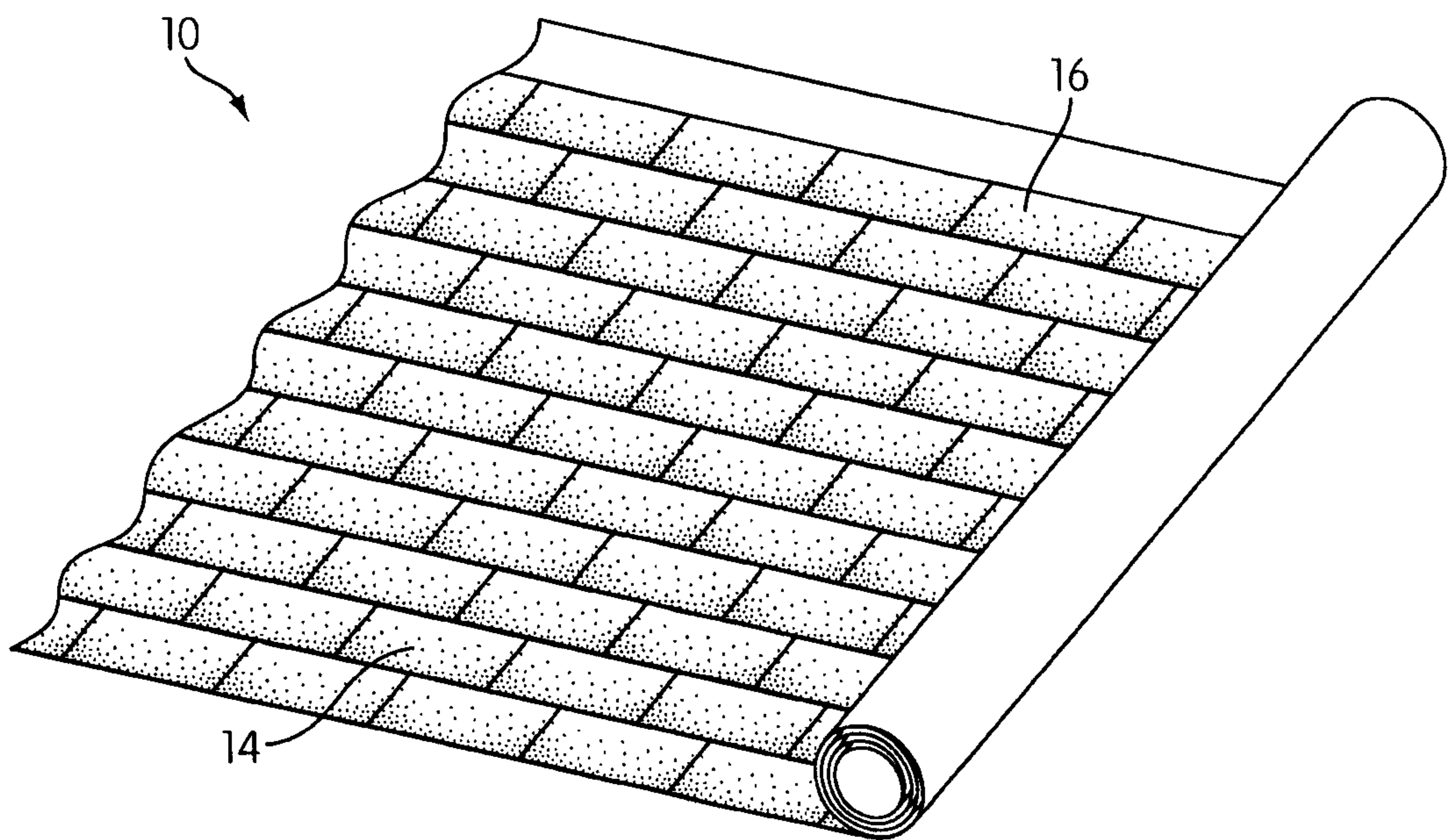


FIG. 1

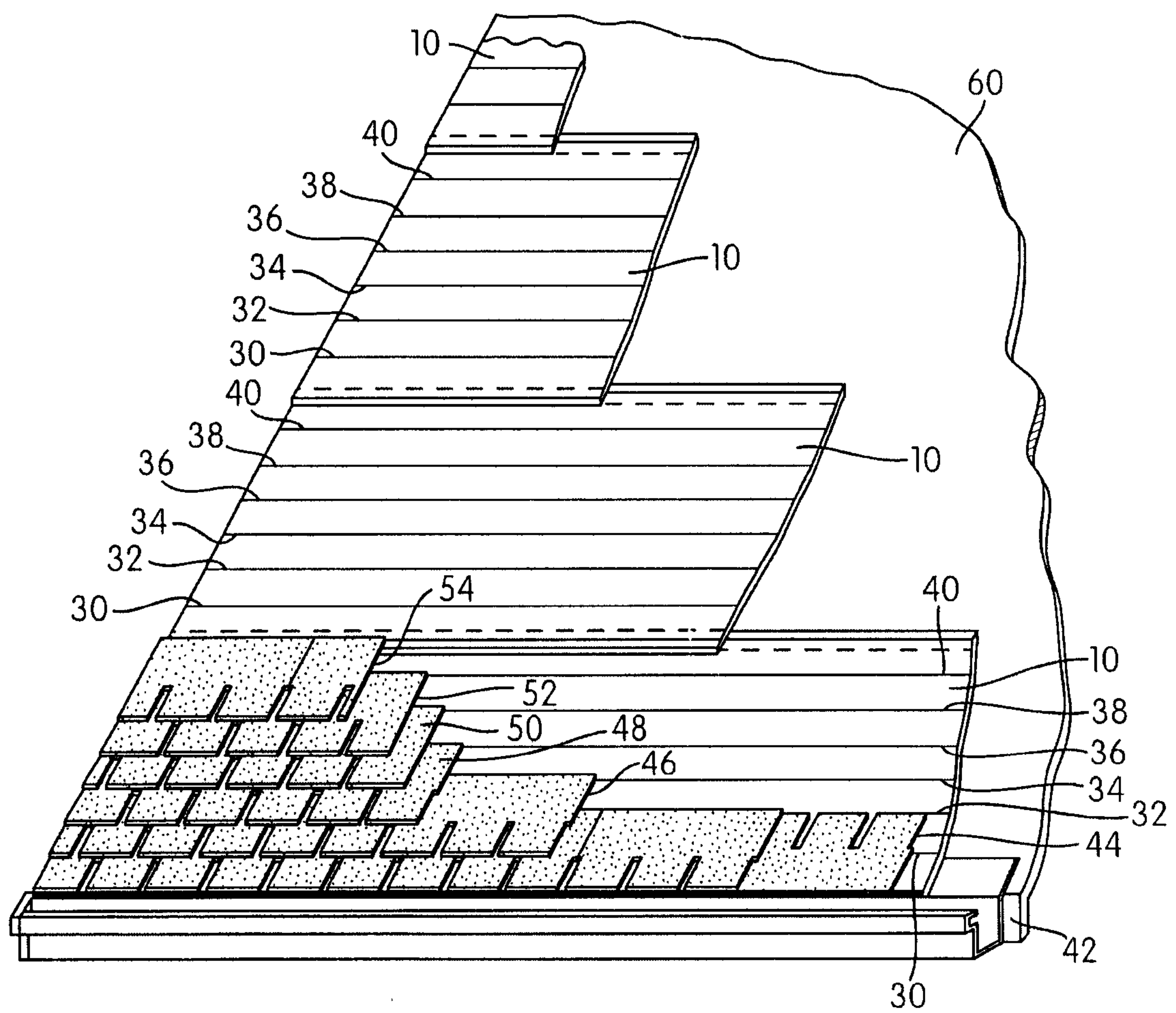


FIG. 2

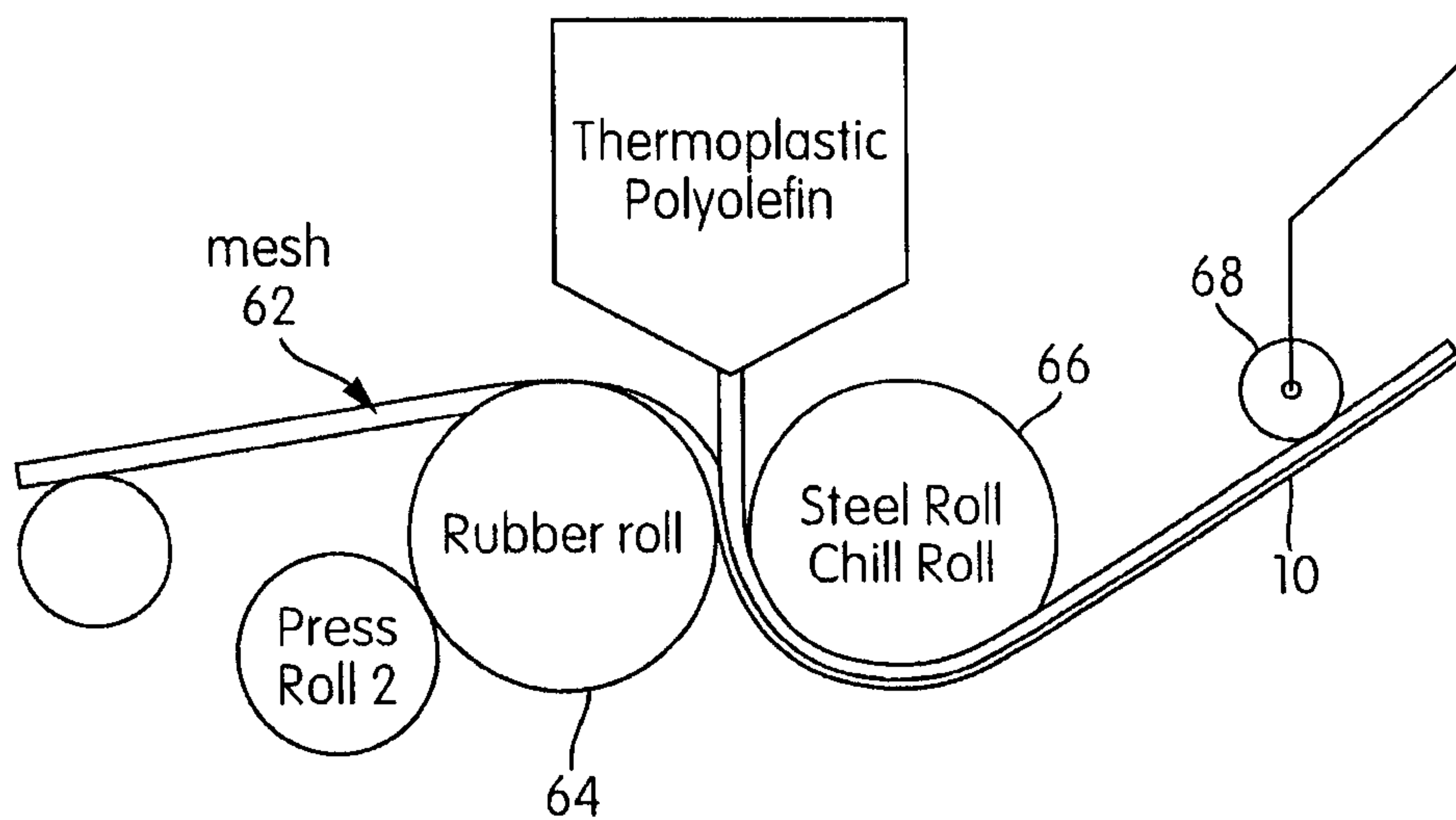


FIG. 3

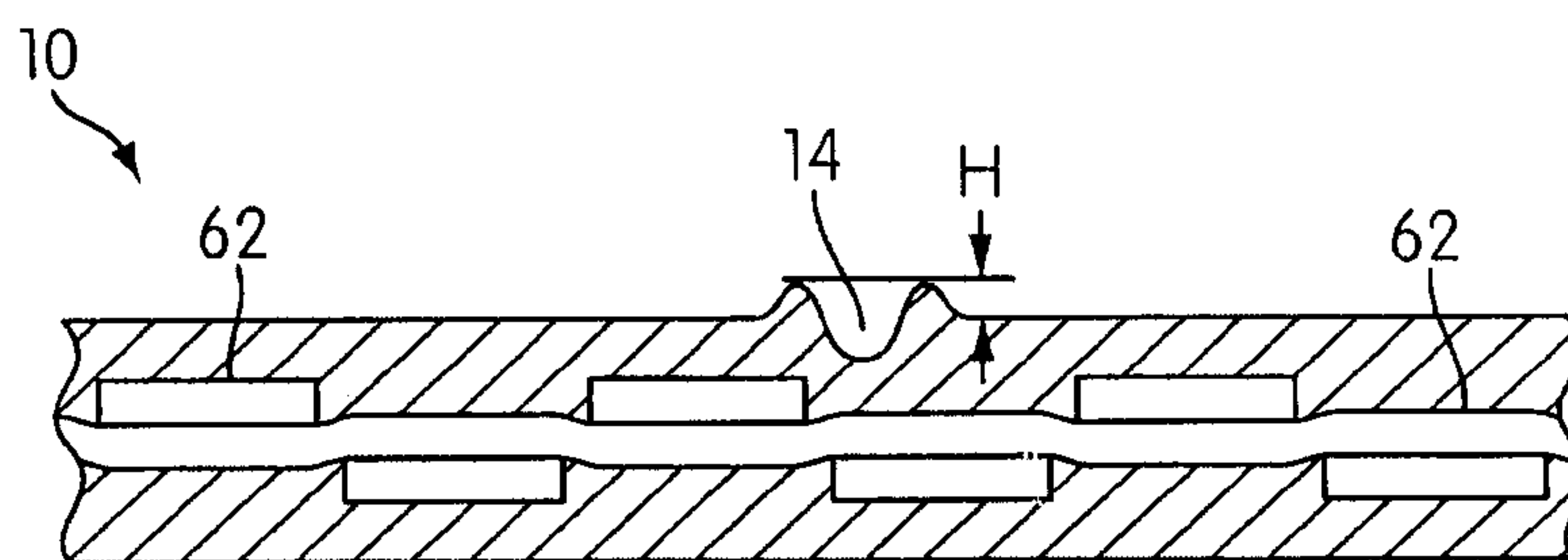


FIG. 4

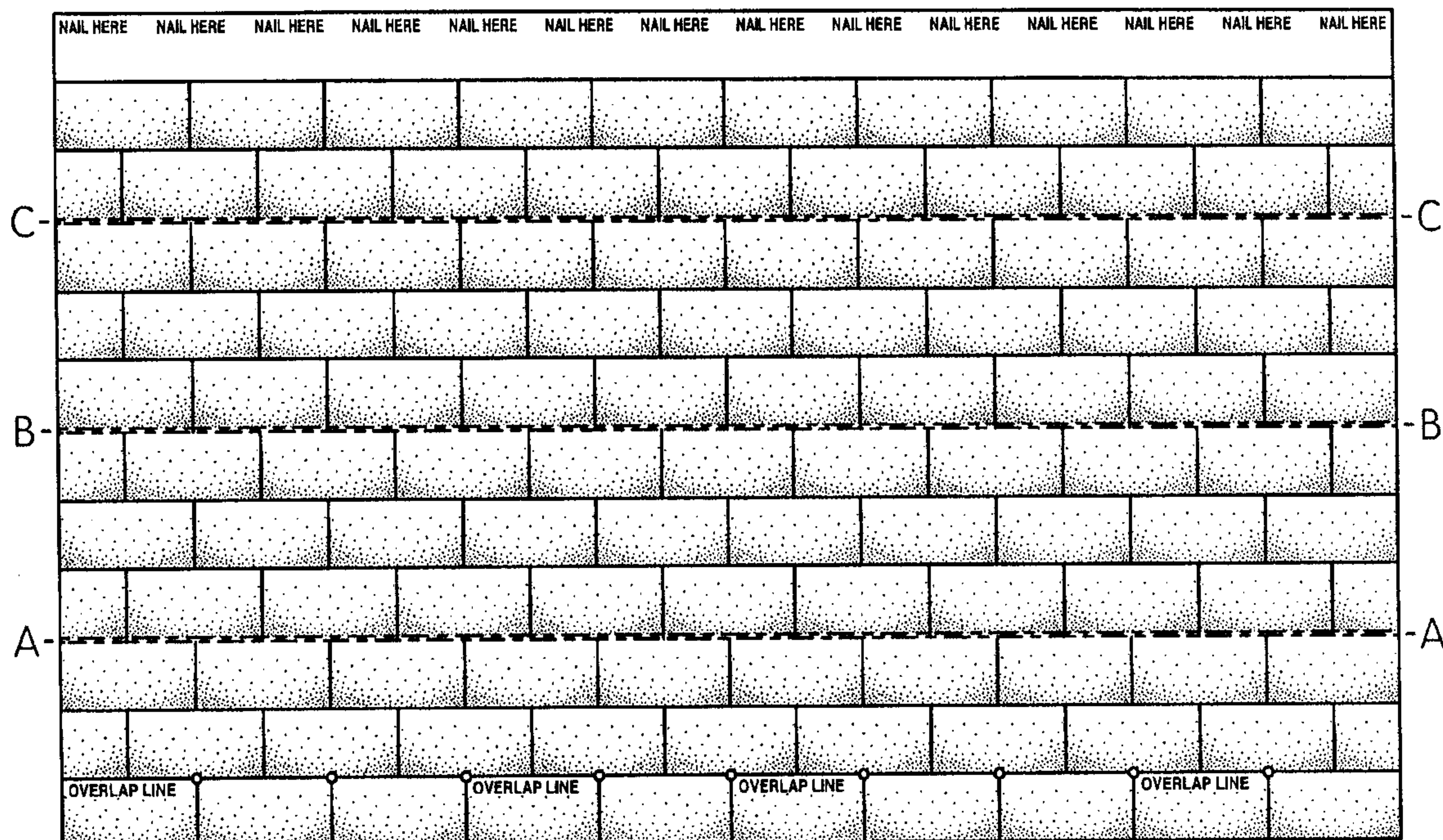


FIG. 5

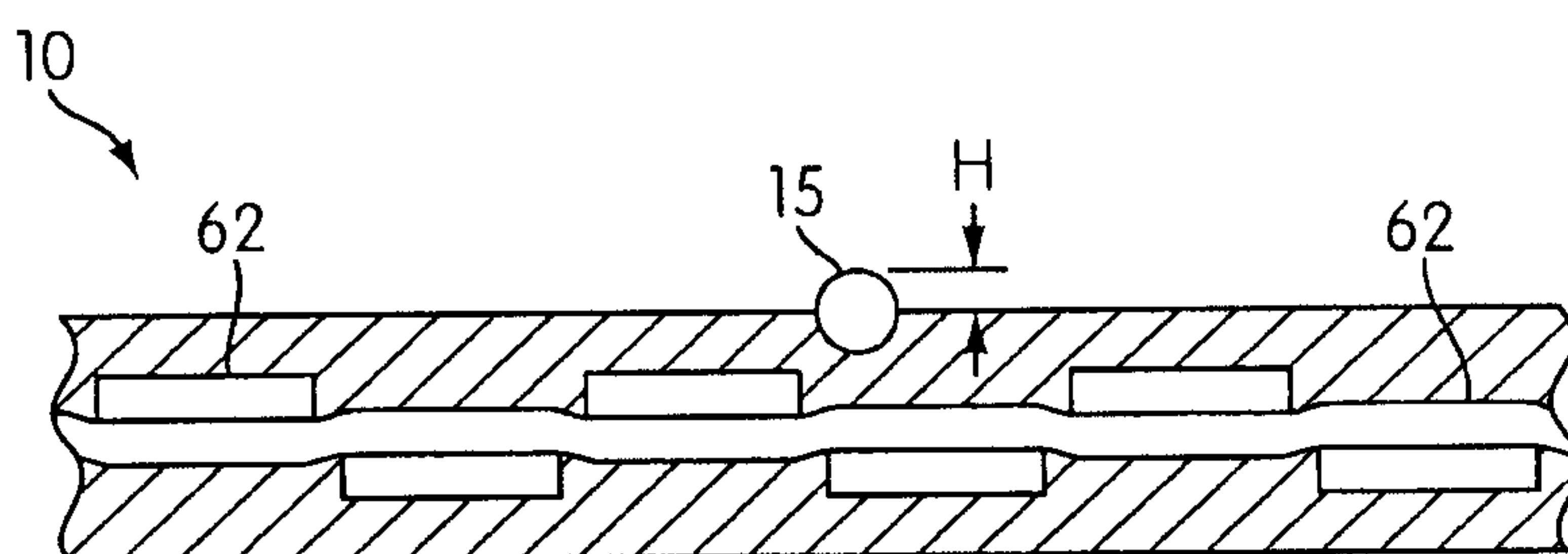
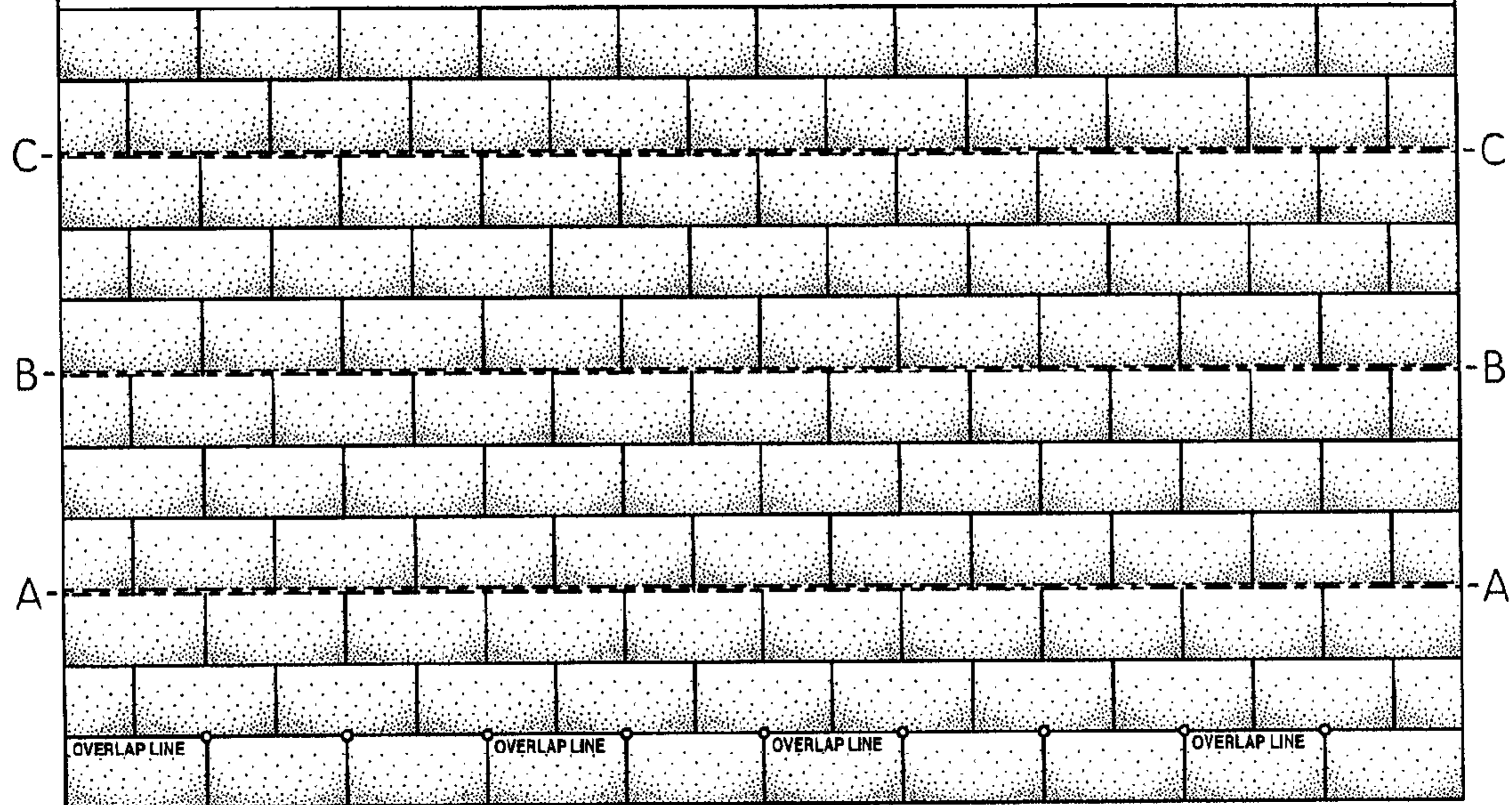


FIG. 6

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OVERLAP LINE

OVERLAP LINE

OVERLAP LINE

OVERLAP LINE