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(54) **FLOORING UNDERLAYMENT SYSTEM**

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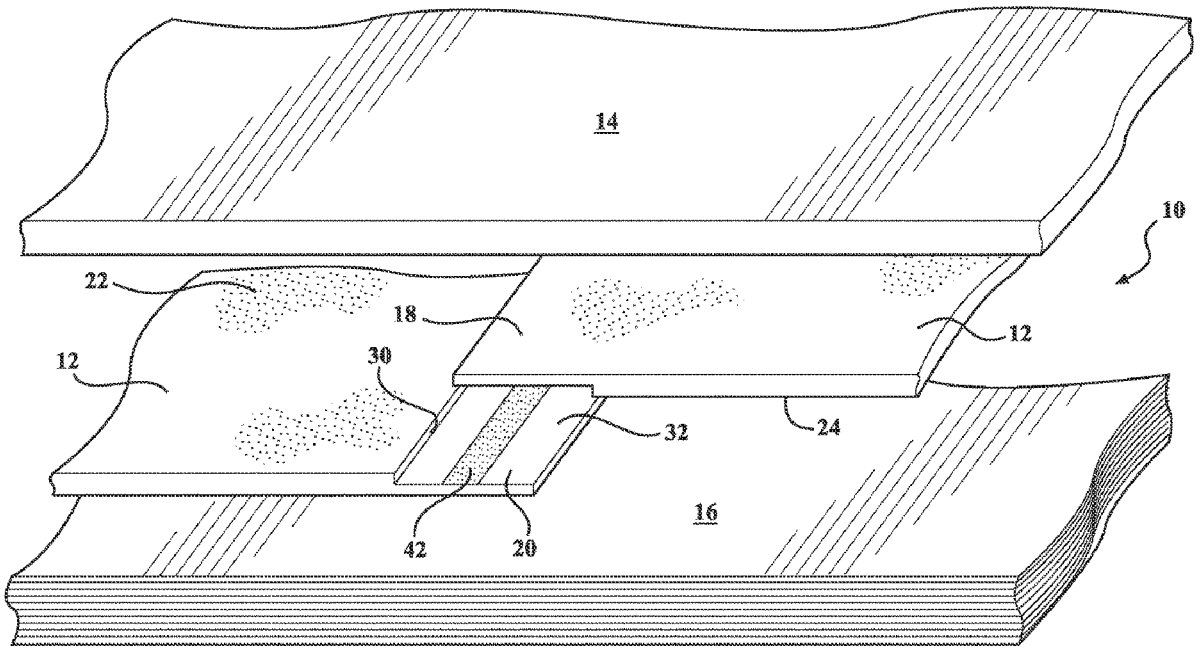
(57) **ABSTRACT**

A system for underlayment of a flooring has at least two foam panels having and a complementary under step portion on one side an an overstep portion on an opposite side. The understep portion has an adhesive strip with a release liner. The panels are joined by placing the overstep portion of one panel over the understep portion of an adjacent panel and removing the release liner. The overstep portion is then adhered to the overstep portion to seal the panels together. A method of grinding foam strips to form the panels is disclosed.



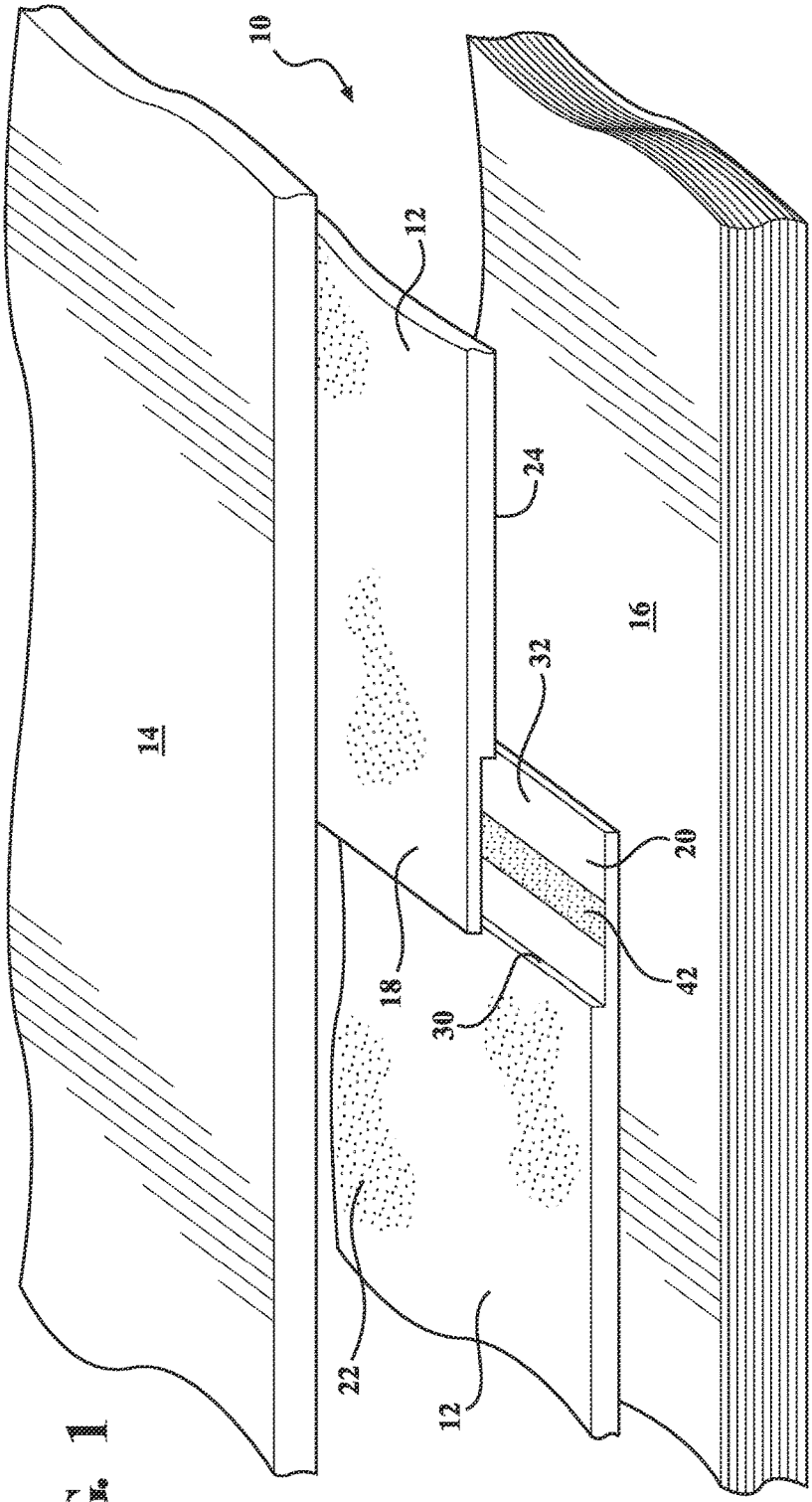

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FIG. 1

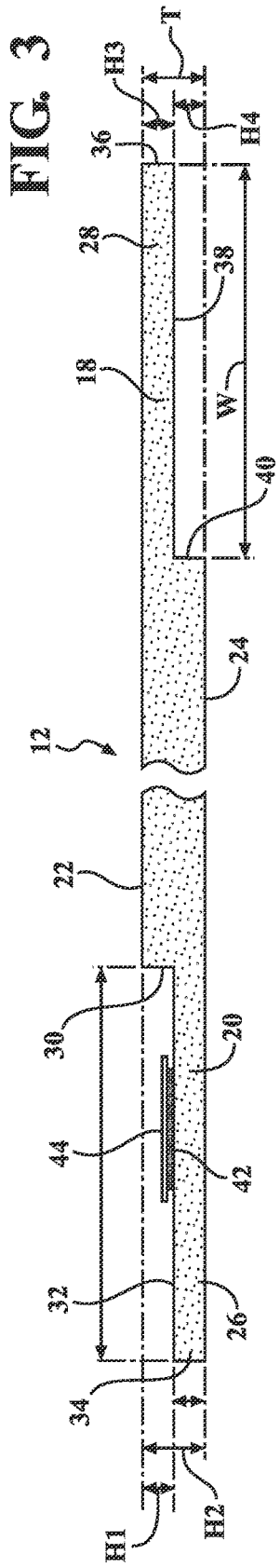
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FIG. 3

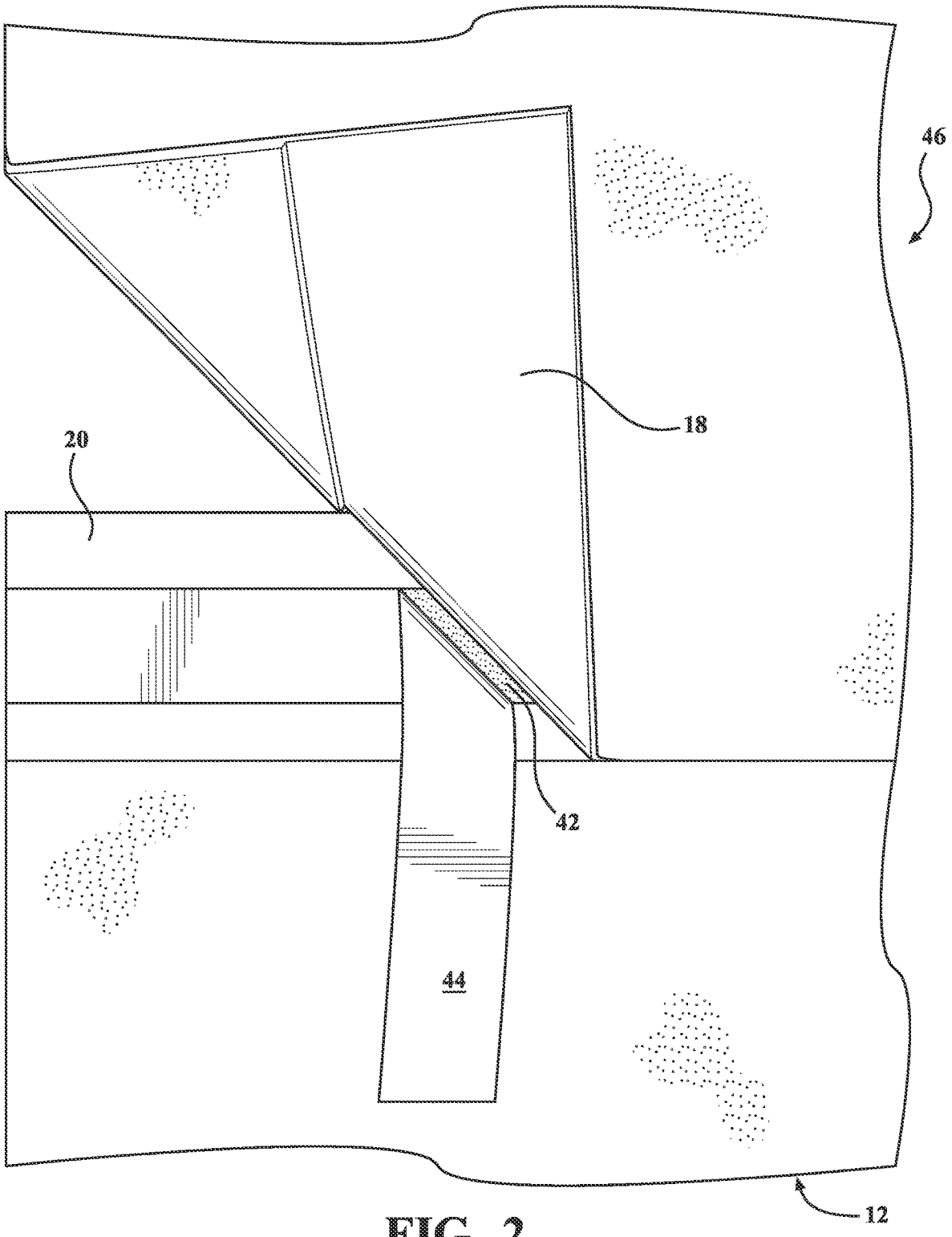

FIG. 2

FLOORING UNDERLAYMENT SYSTEM

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This Application claims the benefit of U.S. Provisional Application 62/967,076 filed on Jan. 29, 2020.

FIELD OF THE INVENTION

[0002] The invention relates to flooring underlayment systems and more particularly to foam underlayment panels.

BACKGROUND OF THE INVENTION

[0003] It is known to provide an underlayment between a sub-floor and solid finished flooring such as hardwood, engineered hardwood and composites. The purpose of the underlayment is to provide sound abatement for a room, to provide a moisture barrier between the sub-floor and the finished floor, and to provide a filler between the uneven surfaces of the subfloor and finished floor. The underlayment is frequently required by code. Many manufacturers of flooring also require the underlayment as a moisture barrier to prevent the finished floor from swelling or warping.

[0004] The underlayment may be produced from foam such as polyethylene, polyurethane, polystyrene and polypropylene. The foam is generally provided in rolls which are 36 inches to 48 inches wide. The foam is unrolled to form and cut to form a panel a panel and then joined together before the finished flooring is installed on top of the underlayment. The panels are joined together to ensure that moisture does not penetrate the flooring. One method of joining the underlayment is to abut the edges of the panels together and then adhesive tape is dispensed from a roll over the abutted edges of the panels to form a seal. This method is slow. It is also known to form panels with a lip of thin film which extends outwardly from a side edge of foam panel. An adhesive strip with a release liner extends along the other side edge of the panel. The panels are placed next to each other with the extending over the adhesive strip of the adjacent panel. The release liner is removed and the lip is sealed to create a bond preventing moisture migration. However, these systems permit gaps to be present between the panels which results in decreased effectiveness of sound abatement and moisture barrier.

SUMMARY OF THE INVENTION

[0005] A system for underlayment of a flooring on a subfloor includes a plurality of foam panels. Each of the panels has top surface and a bottom surface. The bottom surface of each panel is positioned on the subflooring and the flooring is positioned on the top surface. Each panel has a pair of sides. One side has an understep portion with an understep surface and another side has a complementary overstep portion with an overstep surface. The understep surface has an adhesive. The overstep surface of one panel is overlayed on the understep surface and joined together with adhesive. The total thickness of the overlayed overstep portion and understep portion is equal to a thickness of the foam panel. A method of making foam panels for the system includes grinding an overstep portion on one side of a top surface of the panel and a bottom surface cutting an understep portion on another side of the panel.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] FIG. **1** is a perspective view of an improved underlayment system;

[0007] FIG. **2** is a top view of a portion of a pair of panels with an overstep portion of a panel turned over; and

[0008] FIG. **3** is an end view of a pair of panels joined together.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0009] As shown in FIG. **1**, an improved underlayment system **10** includes a plurality of foam panels **12** sandwiched between a finished flooring **14** and a subflooring **16**. Each of the panels **12** has an understep portion **20** and a complementary overstep portion **18**. The understep portion has an adhesive. Adjacent panels are joined by overlaying the overstep portion **18** onto understep portion **20** of an adjacent panel and sealing with the adhesive. Thus, provides a fast and economical way of providing excellent sealing and fast installation.

[0010] The finished flooring **14** is mounted to a top surface **22** of the foam panels **12**. The finished flooring **14** may be hardwood, engineered hardwood or composite material. A bottom surface **24** each of the foam panels **12** rests on the subflooring **16**. The subflooring **16** is typically plywood.

[0011] Each foam panels **12** is formed from rolls of foam material. A suitable foam material is polypropylene having a density of 2.0 to 6.0 lbs/cuff and a thickness of 1.0 to 3.0 mm However, other foams may be used such as polyethylene, polyurethane, polystyrene in various densities and thicknesses.

[0012] As shown in FIGS. **1** and **3**, the understep portion **20** extends on one side **26** of each panel **12** and the overstep portion **18** extends on another side **28** of the panel **12**. The understep portion **20** has an upper edge portion **30** which extends orthogonally from the top surface **22** to an undercut surface **32**. The undercut surface **32** is spaced apart and parallel to the bottom surface **24**. The undercut surface **32** extends to a lower edge portion **34** extends portion **34**. The lower edge portion **34** extends orthogonally between the undercut surface **32** the bottom surface **24**.

[0013] The overstep portion **18** has an upper edge portion **36** extending orthogonally between the top surface **22** and an overstep surface **38**. The overstep surface **38** is spaced apart and parallel to the bottom surface **24**. The overcut surface **38** extends between the upper edge portion **36** and a lower edge portion **40**. The lower edge portion **40** extends orthogonally downwardly to the bottom surface **24**. The upper edge portion **36** of the overstep portion **18** has a height |H**3**| equal to the height |H**2**| of lower edge portion **34** of the understep portion **20**. The understep portion **20** and overstep portion **18** are complementary such that when overlaid, the top surfaces **22** and bottom surfaces **24** of the panels **12** are on the same plane and have a thickness |T| and there are no gaps between the upper edge portions **30**, **36** and lower edge portions **34**, **40**. In the preferred embodiment, the upper edge portions **30**, **36** and the lower edge portions **34**, **40** are of equal height H**1**, H**2**, H**3**, and H**4** of the panel **12**. The undercut surface **32** and overcut surface **38** have an identical width |w|. A width |w| of about two inches has been found to provide an excellent sound and water barrier properties.

[0014] An adhesive strip **42** extends over the understep surface parallel to the lower edge portion **34**. A suitable

adhesive is acrylic; however, other adhesives may be used. A release liner **44** is positioned over the adhesive. The release liner has a smooth, glossy surface facilitating removal of the liner. Alternatively, the adhesive could be placed on the overstep surface **38** or applied at the time of installation.

[0015] As shown in FIG. **2**, the panels are installed by laying one panel **12** on the subflooring **16**. An adjacent panel **46** is positioned with the lower edge **34** of panel **12** in abutment with the lower edge **40** of the adjacent panel **46**. The overstep portion **18** is folded back and the release liner **44** is removed. The overstep **18** is then positioned on the adhesive to seal the panels **12**, **44** together.

[0016] A method of forming the panels includes the steps of forming a strip of a foam material having a pair of side portions removing the top side of one edge portion to a predetermined depth and width to form undercut portion, and removing a bottom side of the strip to form an overcut with an overcut surface having a predetermined width an upper edge and a lower edge each having a predetermined height. A cutting wheel is used to remove the understep and overstep into the sides of the strip. The cutting wheel may be mounted to a fixture which has a guide for aligning the edge of the panel the bottom surface of the strip. The cutting wheel is supported in position by the fixture to form a predetermined height to form the undercut along the edge of the foam to the desired width and depth. The strip is then inverted and opposite side is moved through the fixture to remove the bottom side along the opposite edge to the desired width and depth. Adhesive is applied to the undercut surface from a dispense and release tape is applied to the adhesive to cover the adhesive strip. Panels are formed at the time of installation by cutting a desired length from the strip.

[0017] Alternatively, the roll material is moved through a heater to make the material moldable. The material would then be moved through nip rollers to make a depression and form the undercut and overcut.

1. A system for underlayment of flooring on a subfloor, the system comprising:

at least two foam panels each of the foam panels having a top surface adapted to be placed under the flooring and a bottom surface adapted to be placed on the subfloor, each of the panels further having a pair sides, one of the pair of sides having an understep surface extending between an upper edge portion and a lower edge portion, the understep surface is spaced apart and parallel to the top surface;

another side of the par of panels having an overstep surface extending between an upper edge portion and a lower edge portion, the overstep surface is spaced apart and parallel to the top surface.

2. The system of claim **1**, further comprising a strip of adhesive applied to either the understep surface or overstep portion.

3. The system of claim **2**, tape is applied to the adhesive.

4. The system of claim **1**, wherein the width of the understep surface is equal to the width of the overcut surface.

5. The system of claim **1**, wherein the upper edge portion of the overstep portion has a height equal to a height of the lower edge portion of the understep portion.

6. The system of claim **1**, wherein the upper edge portion of the understep portion and overstep portion and the height of the lower edge portion are equal.

7. The system of claim **1**, wherein the overstep portion of one of the at least one panel is positioned over the understep portion of another panel.

8. A method of forming a foam panel for an underlayment system comprising:

removing a top surface at one edge of foam strip with a cutting wheel to remove a portion of the top surface to form an under step having a predetermined depth and width; and

removing a bottom surface at an opposite edge of the strip to form an overstep portion having a predetermined width and depth applying an adhesive to either the understep surface or the overstep.

9. The method of claim **8**, further comprising applying an adhesive strip to either the understep or overstep.

10. The method of claim **9**, wherein a release liner is applied to cover adhesive.

11. The method of claim **8**, wherein the strip of foam is coiled into a roll after the release liner is applied.

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