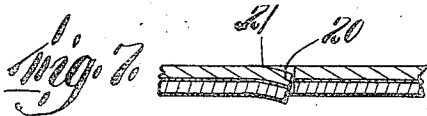
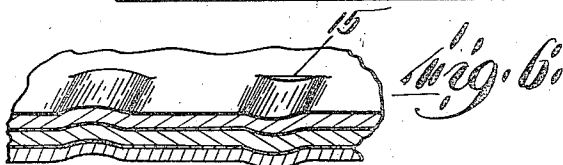
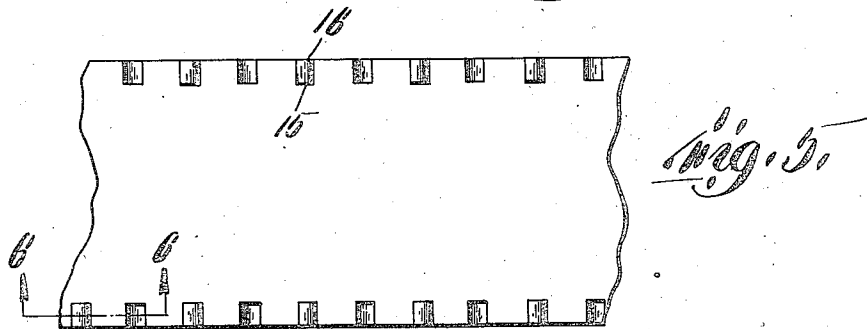
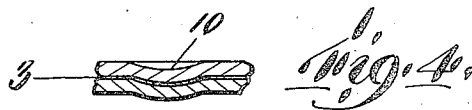
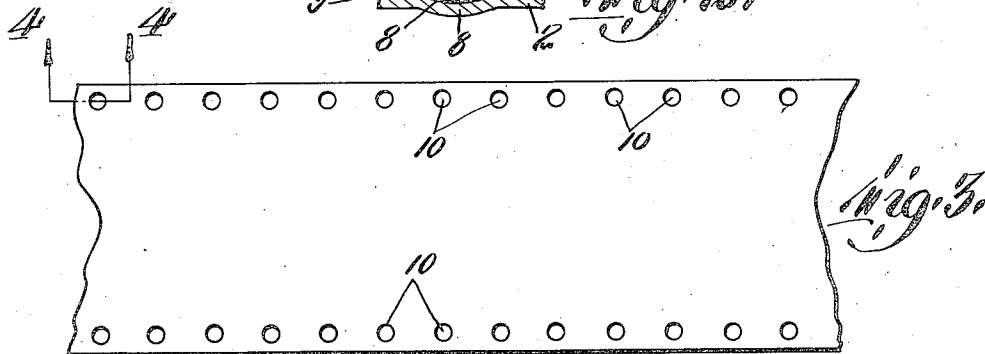
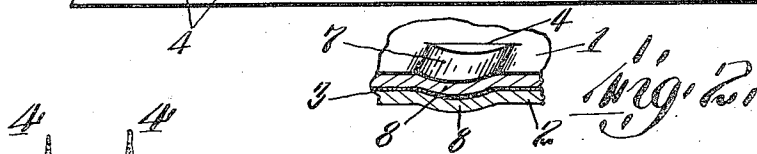
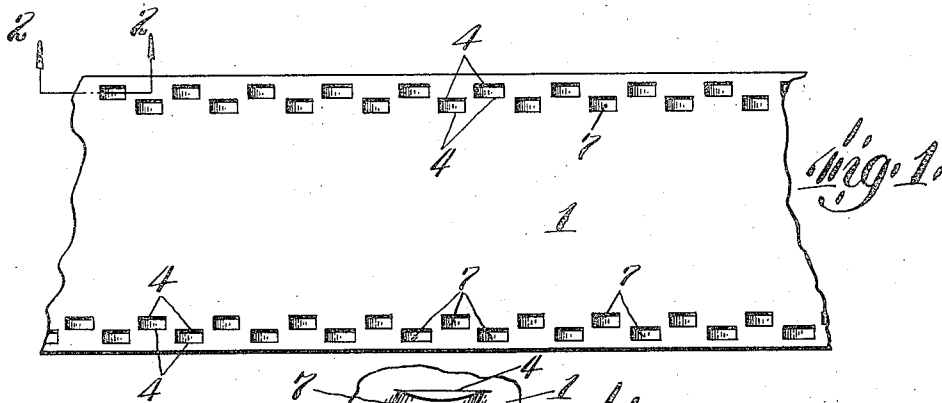


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1,493,447

O. A. HEPPEES
LAMINATED SHEET MATERIAL AND METHOD OF PREVENTING SLIPPAGE
BETWEEN THE LAMINATIONS
Filed June 5, 1922



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Attys

UNITED STATES PATENT OFFICE.

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LAMINATED SHEET MATERIAL AND METHOD OF PREVENTING SLIPPAGE BETWEEN
THE LAMINATIONS.

Application filed June 5, 1922. Serial No. 566,018.

To all whom it may concern:

Be it known that I, OTTO A. HEPPES, a citizen of the United States, residing at La Grange, in the county of Cook and State of Illinois, have invented new and useful Improvements in Laminated Sheet Materials and Methods of Preventing Slippage Between the Laminations, of which the following is a specification.

For certain purposes, such for example as builder's paper, it has been the practice to form laminated sheet material by cementing one or more layers or plies of paper together face to face, using asphalt or similar viscous material as an adhesive. When this laminated material is piled up, as in the stock room, much difficulty has been experienced with relative slippage of the sheets or laminations, the asphalt or other cementing material flowing slightly, the asphalt appearing as black edges oppositely disposed on the two sides of the complete sheets. Usually these edges must be trimmed off before the sheets are used, thus causing expenditure of labor and time and waste of material. Another troublesome result of this slippage is that piles of the material do not stand up, due to the cumulative effect of slippage between adjacent laminations. This necessitates constant restacking in order both to economize storage space and to insure that the material is in condition for packing and shipping as required.

This invention provides a construction of and method of treating such sheet material preventing or lessening this slippage so as to eliminate waste and to increase the ease with which the material may be stored and transported.

For a more complete understanding of this invention, together with further objects and advantageous details of construction, reference may be had to the accompanying drawings in which—

Figure 1 is a plan of a portion of the material treated according to one method.

Figure 2 is a fragmentary perspective section on line 2—2 of Figure 1.

Figure 3 is a view similar to Figure 1 showing a modified embodiment of the invention.

Figure 4 is a fragmentary section on line 4—4 of Figure 3.

Figure 5 is a view similar to Figures 1 and 3.

Figure 6 is a fragmentary perspective section on line 6—6 of Fig. 5.

Figure 7 is a detailed section showing a further modification.

Referring to Figures 1 and 2, in which two ply material is shown, 1 and 2 indicate upper and lower plies or sheets cemented together by asphalt or similar viscous material 3. Adjacent opposite margins of the sheet a series of slits indicated at 4, may be formed in parallel pairs through the plies so as to form between the pairs strip 7 which may be indented from one face of the material out of the planes of the plies to form local interlocking securing elements 8 in the two plies. All these portions 7 may be struck in the same direction, or, if desired, they may be struck in opposite directions as shown for example in Figure 6. Slippage between the plies is prevented in this construction by the portion 7 of the ply 1 engaging opposite a flat portion of the ply 2.

Another method of forming the interlocking elements on the various plies is shown in Figures 3 and 4 in which a series of indentations 10 may be made on one or both faces of the material causing mating indentations in the remaining plies. Such indentations may be produced by the use of a rounded plunger which may be driven against one face of the material.

In Figures 5 and 6 is shown a still different method in which slits 15 are arranged parallel with the edges of the material near the margins and the partially severed strips 16 between the slits 15 and the margins are laterally deflected similar to the portion 7 of the form shown in Figures 1 and 2. These views show three ply material.

Still another method is shown in Figure 7 in which material may be partially punched, being cut entirely through on one side of the punched portion, as shown at 20, so as to offset portions of the plies relative to their main portions, the opposite sides 21 of the punched parts being preferably uncut.

In all these constructions it is evident that local interlocking elements are formed between the several plies which prevent relative slippage thereof otherwise possible

due to the viscosity of the cementing material. These interlocking elements are formed from the material of the plies and may be so small and inconspicuous as to have
 5 no deleterious effect on the usefulness of the material.

Having thus described certain embodiments of this invention, it should be evident to those skilled in the art that many
 10 other changes and modifications might be made therein without departing from its spirit or scope as defined by the appended claims.

I claim:

15 1. The method of preventing slippage between a plurality of sheets of material cemented face to face with viscous material, which consists in locally cutting the cemented material and deflecting it adjacent
 20 the cuts.

2. The method of preventing slippage between a plurality of sheets of material cemented face to face with viscous material, which comprises cutting pairs of spaced
 25 slots therein and deflecting the material between said slots.

3. Laminated sheet material having its laminations cemented together with viscous material, and cut through locally, the ma-

terial adjacent said cuts being bent out of
 30 the planes of the laminations to form interengaging locking elements.

4. Laminated sheet material having its laminations cemented together with viscous material, and being cut through by a series
 35 of pairs of spaced slits, the material between said slits being deflected out of the planes of the laminations to form interengaging locking elements.

5. Laminated sheet material having its laminations cemented together with viscous material, and cut through locally adjacent
 40 its margin, the material adjacent said cuts being bent out of the planes of the laminations to form interengaging locking elements.
 45

6. Laminated sheet material having its laminations cemented together with viscous material, and being cut through by a series
 50 of pairs of spaced splits adjacent its margin, the material between said slits being deflected out of the planes of the laminations to form interengaging locking elements.

In testimony whereof I have affixed my
 55 signature.

OTTO A. HEPPEL.