June 5, 1928. 1,672,537

I. J. NOVAK

FLOOR COVERING

Filed April 12, 1922

Fig. 1.

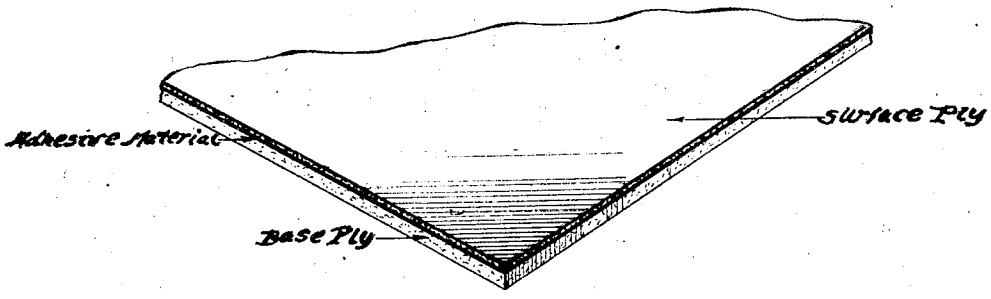
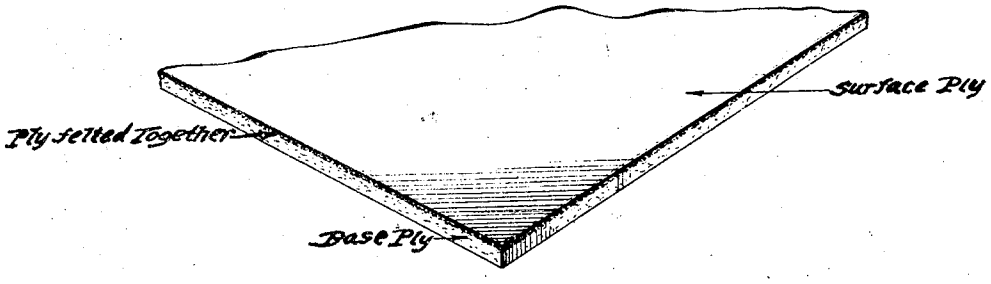


Fig. 2.



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UNITED STATES PATENT OFFICE.

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FLOOR COVERING.

Application filed April 12, 1922. Serial No. 552,021.

This invention relates to improvements in floor covering, and refers more particularly to a floor covering built up of plies. Among the objects of the invention are to provide a durable floor covering of wide adaptability which will serve for similar purposes as the ordinary linoleum is now used.

Linoleum as it is commonly made at the present time consists essentially of a plastic or paste comprising cork, wood flour. clay and other inorganic fillers with a binder of linseed oil and varnish gums, the whole being applied to a burlap to the desired thickness, and the drying oil allowed to set at an elevated temperature for an extended period before the plastic or paste is sufficiently hard and durable to stand the wear satisfactorily. Due to the fact that the body of the base or material of which the linoleum is made is of finely comminuted materials incorporated with a paste binder, it at no time has adequate tenacity, and is well known to be extremely fragile on handling. This fragility or tendency to crumble becomes more pronounced with age, due to the continual oxidation of the drying oils. Also, the burlap upon which it is formed, rots easily under damp conditions leaving the plastic unsupported and apt to crumble. A floor covering of this type is not suited for universal use and particularly under severe conditions of wear and dampness.

Fig. 1 is a fragmentary perspective view of the material showing the plies combined with the adhesive material. Fig. 2 is a fragmentary perspective view of the material showing the plies combined by felting the separate stocks together.

The floor covering which is the subject of this invention, has a superior wearing surface to the linoleum and floor coverings now commonly used in that it has higher resistance to abrasion due to the higher binder proportion, and likewise its waterproof qualities are correspondingly better.

The floor covering as formed, consists of two plies. Below the tough wearing surface is a base substance of a different character for the purpose of obtaining limpness, so that the flooring shall lie flat without curling. This base material is especially adapted to this feature, combining also low compressibility, high waterproof qualities and negligible fragility. The base is of a fibrous nature containing no drying oils, thus dispensing with burlap, and does not harden with age. It may be made in any desired color to harmonize with the surface ply, or its color may be identical to that of the surface layer. These two layers or plies as desired, are combined in any relative thickness that may be desired, according to the wear to which they are subject and the life required. Thus in making a sheet .125 inch in thickness, the surface coat may be .010 inches in thickness to .030 inches as desired. The thickness of the surface coat is the important factor in deciding the life of the material. The following is a representative furnish intended for the surfacing ply:

60 parts chrome leather shavings,
40 parts cotton or jute,
125 parts wood flour or cork,
50 parts coloring pigments,
500 parts dry varnish—1 part linseed oil, 1 part copal,
200 parts clay,
50 parts sodium silicate,
70 parts alum.

The method of preparing these constituents for the surface ply is to mix them thoroughly in a beater or Hollander to form a non-adhesive emulsion in a water vehicle, the varnish, bitumen or waxy binder being incorporated with the fibre and the adhesive particles being surrounded by non-adhesive films of the water and the emulsifying agent. The stock or furnish is then passed over a paper machine in a similar manner to a common paper stock. A smaller amount of fibre is used in connection with the stock in order to carry the filler materials and emulsion during the paper making operation.

Subsequent to its being sheeted, the stock is dried, and upon the application of heat and pressure the binder material coalesces and serves as a bond incorporating the fibre and filler materials into a tough flooring material.

After drying and calendering so as to flux and coalesce the varnish or binder substances throughout the material, it is allowed to age for about one week at a temperature of 150° F., so as to thoroughly dry the binder. It will be noted that the pro-

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portion of binder to fillers is greater than usual to the common types of linoleum or paint surface.

A typical furnish of the base material may consist of the following:

30 parts chrome leather shavings,
70 parts cotton or jute,
125 parts wood flour or cork,
50 parts coloring pigments,
500 parts wax tailings,
250 parts clay,
50 parts sodium silicate,
80 parts alum.

This base material is emulsified in a water vehicle in a similar manner to that explained above. and is sheeted in a paper making operation as previously described.

In the production of the base material it is unnecessary to put it through the aging stage, as the drying and calendering operation will adequately flux and coalesce the binder substance and dry it sufficiently for immediate use.

It is understood that although typical furnishes for the surface and base layers have been recited, that variations both in the amounts and in the character of the materials may be used without departing from the subject matter of the invention. The binder substances may be varied in that wax tailings, varnish and innumerable other colorable bitumens, resins or gum substances may be used as a binder for either the base or surfacing layers.

Further, the invention is not restricted to any one kind of fibre or binder substance, as many combinations have been found during the experimental work that are adaptable to the purpose and included in this invention.

The two plies may be united in any desired manner, either by the ordinary method of covering the base material with cementitious substances such as paste, asphalt or adhesive waterproof substances, subjecting the layers to a calendering operation.

Another manner of combining the layers is to change the film or stock formed on the cylinder mould of a wet machine from one variety to another, thus imposing the surface layer directly upon the base material during the formation upon the machine. The forming of the material in this manner partially incorporates the surface layer with the base material, and a substantially inseparable bond units them into what amounts to a unit or single layer of material.

In incorporating the emulsified binder substance with the furnish or stock to be sheeted, it is desirable first—to form the emulsion by thoroughly mixing and dispersing the adhesive binder in a water vehicle by using the clay as an emulsifying agent. When the binder, which as explained, may consist of any colorable bitumen, rosin, gum, wax tailings or similar substance, has been agitated and mixed with clay and water in sufficient proportion to produce a non-adhesive emulsion of the binder substance the mixture is combined with the fibrous and filler constituents and thoroughly incorporated therein. The addition of sodium silicate and alum serve to cause the emulsified binder substance to gather about and cling more tenaciously to the fibrous stock, and after being sheeted and coalesced by heat and pressure, the binder will be found to be more thoroughly incorporated in the body of the sheeted material when fixing substances of this character are used.

I claim as my invention:

1. A laminated floor covering, comprising a limp, felted fibrous base of low compressibility and hardness combined with a tough felted fibrous surface, said unitary structure being characterized in that the percentage of non-fibrous constituents is materially greater than the fibrous constituents, and further characterized in that the proportion of binder is greater than the filler constituents, excluding fiber.

2. A laminated floor covering, comprising a limp, felted fibrous base layer of low compressibility and hardness combined with a tough felted fibrous surface layer, said unitary structure being characterized in that the percentage of non-fibrous constituents is materially greater than the fibrous constituents, further characterized in that the proportion of binder is greater than the filler constituents, excluding fiber, and further characterized in that said base contains no substantial amount of drying oil.

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