Dec. 23, 1958 SVEN ÅKE ANDERSSON ET AL 2,865,058

COMPOSITE FLOORS

Filed April 4, 1956 2 Sheets-Sheet 1

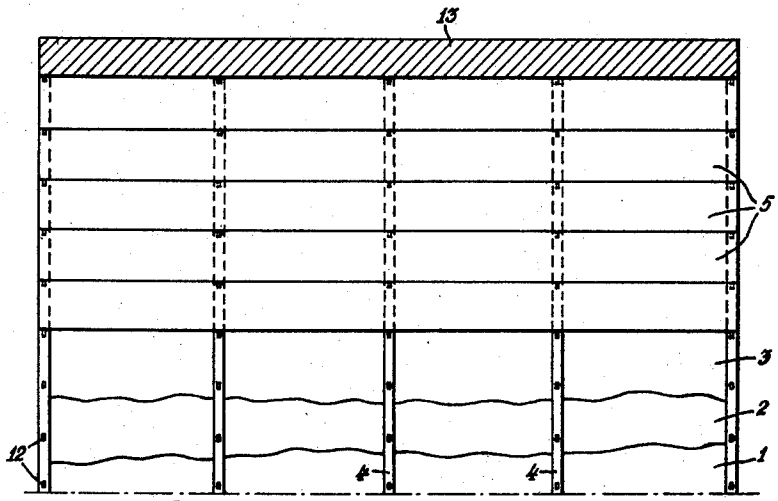


Fig. 1

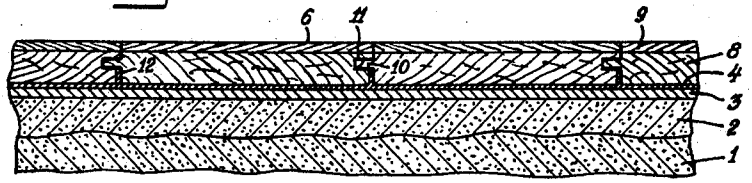


Fig. 2

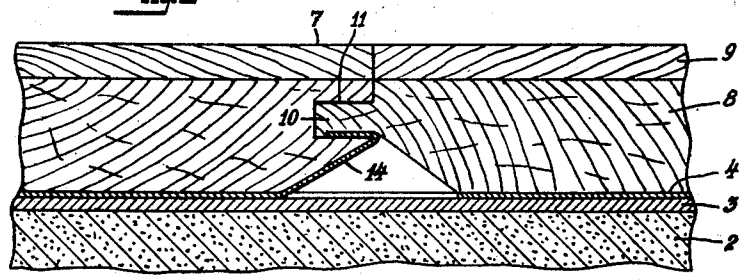


Fig. 3

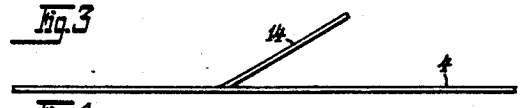


Fig. 4

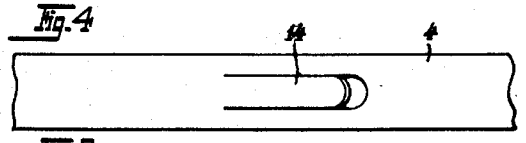


Fig. 5

Inventors
S. Å. Andersson
A. G. Magnusson
By Glascock Downing & Seebold
Attys.

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COMPOSITE FLOORS

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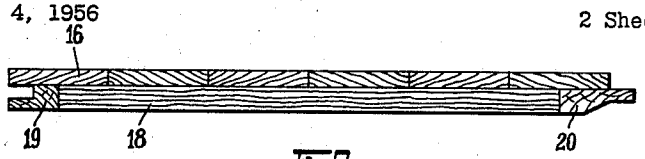


Fig. 9

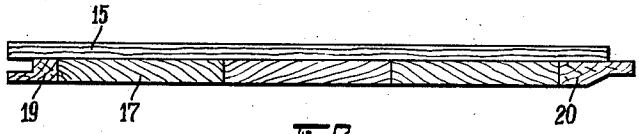


Fig. 8

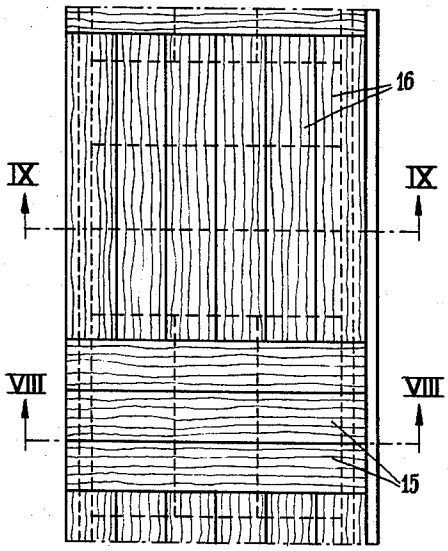


Fig. 6

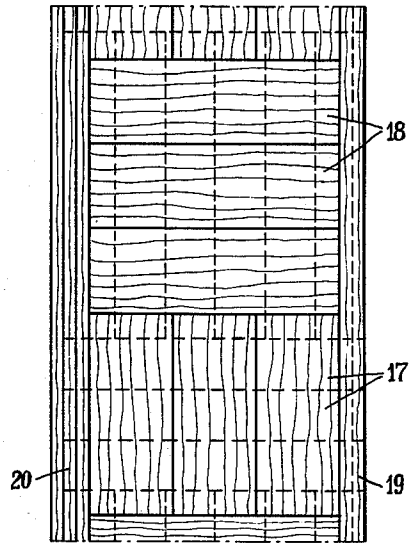


Fig. 7

INVENTORS
S. Å. Andersson
A. G. Magnusson
By Glascock Downing & Seebold
ATTYS.

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COMPOSITE FLOORS

Sven Åke Andersson and Arvid Gerhard Magnusson, Nybro, Sweden, assignors to Gustaf Kähr, Stockholm, Sweden

Application April 4, 1956, Serial No. 576,137

Claims priority, application Sweden April 12, 1955

4 Claims. (Cl. 20—7)

The invention relates to a floor structure and a method of making the same.

More particularly, the invention has reference to a structure having the boards placed upon a sub-floor on metal clamping strips with stamped-out tongues for keeping the boards in a correct position relative to one another.

A flooring of this kind has been suggested, which comprises thick and narrow massive boards. A disadvantage thereof, however, is that such boards are liable to shrinking, swelling and warping considerably caused by variations in their moisture content. To prevent the flooring from breaking up when swelling the metal strips have been anchored in a concrete sub-floor by means of expansion belts, but the metal strips and the tongues cannot in this way resist such extraordinary forces which can be caused by such boards.

It is an object of the invention to provide a floor structure with a wooden flooring in which the boards are kept close together independently of variations in their moisture content.

Another object of the invention is to provide a flooring consisting of relatively thin boards which when being laid may be rectified and closely jointed without nailing the same to a sub-floor.

A further object of the invention is to provide a floor structure with flooring boards which can be laid freely on a sub-floor with tight joints and remain even.

A still further object of the invention is to provide a floor structure with a concrete sub-floor having a rough upper surface and an even, light and cheap wooden flooring; further to provide a floor structure of a low total height in combination with especially good qualities of the wooden floor.

With these and other objects in view, as will be more fully disclosed as the description proceeds, our invention consists in certain constructions and arrangements of parts as will appear from the following description, claims and the accompanying drawing, in which:

Figure 1 is a plan view of part of a floor according to one embodiment of the invention;

Figure 2 is a vertical section taken through part of a floor of a modified embodiment of the invention;

Figure 3 is a vertical section through part of a floor of a further embodiment,

Figures 4 and 5 are a plan view and side elevation, respectively, of a clamping strip according to the invention,

Figure 6 is a top plan view and Figure 7 a bottom plan view of a board,

Figure 8 is a section along line VIII—VIII in Figure 6, and

Figure 9 is a section along line IX—IX in Figure 6.

In the drawings, **1** indicates a concerete floor which usually has a continuous and relatively flat but rather uneven upper surface. In order to provide a more even support for the wooden flooring the concrete structure is

covered by a lining **2** which may be formed as a thin layer, such as 1 to 3 cm., of a light and hard material, preferably porous concrete, in which case the surface may be levelled before solidifying.

The wooden floor may be laid on the sub-floor thus formed, and covered with a thin intermediary layer **3** such as an insulating sheet of corrugated cardboard or other fibre material allowing depressions. Instead of the layers **2** and **3** a granular material, such as sand, may be provided on the uneven concrete structure **1** and levelled to an even supporting surface for the boards.

As ordinary massive boards are liable to swell, shrink and warp by the influence of variations in their moisture content the board **5** are made as laminated boards composed of different layers glued together with different parts of the board extending with the grain direction in the longitudinal and transverse directions of the board. The boards may thereby be made rather thin and wide and have a width considerably greater than three times their thickness.

The boards **5** in Fig. 1 may be made as the boards **6** and **7** in Figs. 2 and 3 with an upper wearing layer **9** composed of parquet slabs extending in the transverse direction of the boards, whereas a lower layer **8** may consist of a single board as shown in the drawing extending in the longitudinal direction of the laminated board and provided with interconnecting tongues **10** and grooves **11**, but the layer is preferably composed of narrow slabs extending longitudinally and transversely as shown in Figures 6 to 9. The wearing layer consists of transverse parquet slabs **15** and longitudinal parquet slabs **16**, whereas the lower layer comprises longitudinal slabs **17** and transverse slabs **18** between edge fillets **19** and **20**. In this way the board is effectively prevented from swelling, shrinking and warping.

For keeping the floor boards pressed one to another special metal clamping strips **4** are used. They may be formed of strip iron with a width of 10–50 mm. and a thickness of 0.5–2 mm., and in the strip, tongues **12** and **14** are stamped out and bent somewhat upwardly as shown at **14** in Figures 4 and 5. The floor boards are all of the same width, and the distances between the tongues **12** or **14** are the same and equal to said width. The tongues **14** may be as long as shown in Figure 4 and have parallel sides, especially for use in connection with the boards illustrated in Figure 3, but they may also be made shorter as shown at **12** and have any desired form.

The flooring shown in Figure 2 is laid in the following manner. Upon the sub-floor comprising the layers **1**, **2** and **3** a plurality of clamping strips **4** are placed parallelly to each other with the tongues **12** extending obliquely upwards as shown at **14** in Figs. 3 and 4. The first board is placed upon and across the clamping strips close to one of the walls so as to bear against the first tongues **12** bent right upwards, and the board is thereafter pressed down so that the strips are pressed into the cardboard layer **3** and the board rests with its whole lower surface on the cardboard. The next tongues **12** are now, by means of a hammer, bent upwards against and substantially countersunk into the side edge of the board. It is now controlled that the board rests along its entire length on the cardboard, and the next board is now placed on the strips and brought in close relation to the first board. The second tongues are then bent against and substantially into the board which thereby is driven still more closely unto the first board, and if this second board should not be quite straight it is now straightened and maintains its straight form. This cycle is to be repeated, and each time it is controlled that no space appears between the boards and the cardboard.

According to Figure 3 the lower layer **8** of the boards has chamfered edges so that a triangular space is formed

below the joint. If the boards are laid directly on sand this space involves the advantage that the sand cannot be collected between the boards and prevent the formation of a seal tight joint. The boards are laid in the same manner as described in connection with Figure 2, but the long tongues **14** are bent into the grooves **11** by means of a suitable tool whereby a more rigid connection between the boards and the strips is obtained. In this construction of the wooden floor the said space has the further advantage that the tongues cannot form any obstacle for the obtaining of a tight joint.

By the invention a compact and durable floor of a high quality is obtained which maintains its plane form without any connection with the sub-floor and which is free of gaps between the boards making a bad impression and liable to collect dust and the like.

What we claim is:

1. A method of laying flooring, comprising preparing a sub-floor with a substantially flat upper surface, covering the sub-floor with a layer of a material allowing depressions, placing freely on the covering layer a plurality of spaced metal clamping strips having stamped-out tongues equidistant from one another, laying lengths of parquet boards one after another with their lower side freely upon and across the strips and depressing the strips along their entire length into the covering layer so as to bring the whole lower surface of the boards into supporting contact with the covering layer, said boards comprising an upper wearing parquet layer glued to a lower layer provided with tongues and grooves and having different parts extending with the grain direction in the longitudinal and transverse direction of the board to counteract swelling and shrinking and having further a width which corresponds to the distance between the tongues of the strip and is considerably greater than three times their thickness, and pressing each board against the preceding board by bending tongues of the strips against the side edge of the board so as to straighten the same and secure a tight joint.

2. In a floor structure, the combination with a sub-floor having a substantially flat upper surface, of a covering layer provided on said sub-floor and consisting of a material allowing depressions, a plurality of spaced metal clamping strips depressed loosely into the surface of said covering layer along their whole length and having stamped-out and upwardly bent tongues equidistant from one another, and a wooden floor entirely free of said sub-floor and composed of lengths of laminated boards pressed tightly together by said tongues and comprising a wearing parquet layer glued to a lower layer provided with tongues and grooves, and said boards having different parts extending with the grain direction in the longitudinal and transverse direction of the board to counteract swelling and shrinking and resting freely with their entire lower surface on the covering layer and having a width, which is considerably greater than three times their thickness and corresponds to the distance between the tongues of the clamping strips.

3. A floor structure as claimed in claim 2 in which the covering layer is formed of a granular material.

4. A floor structure as claimed in claim 2 in which the covering layer is formed of a resilient layer of a fibrous material.

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