

A. W. NILSSON.
 DIE FOR INTERLOCKED SECTIONAL FLOORING.
 APPLICATION FILED APR. 16, 1910.

999,844.

Patented Aug. 8, 1911.

Fig. 1.

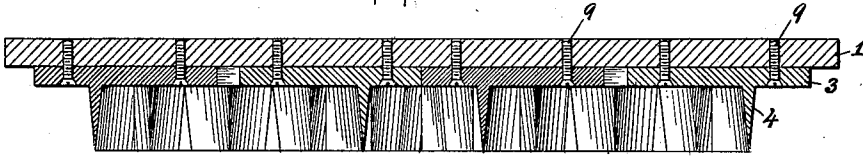


Fig. 2.

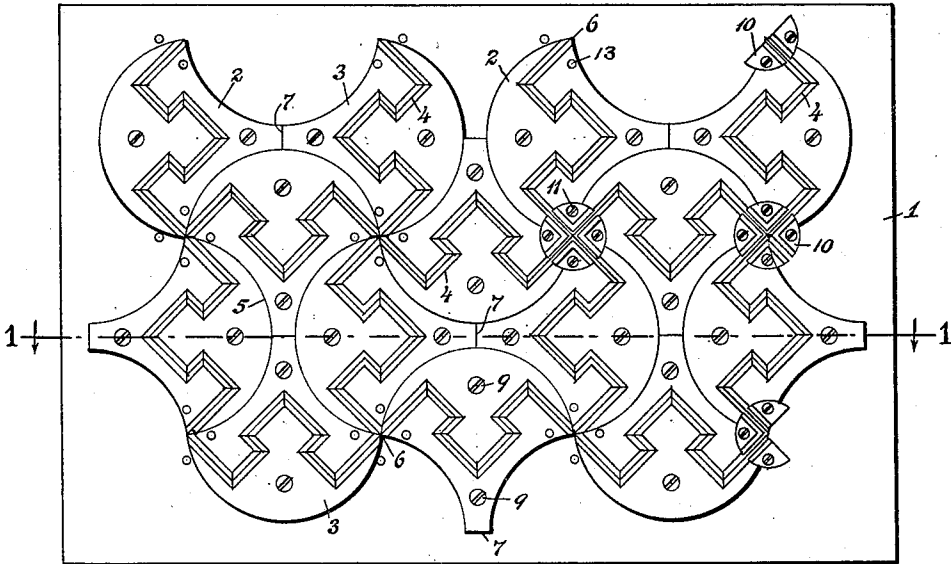


Fig. 3.

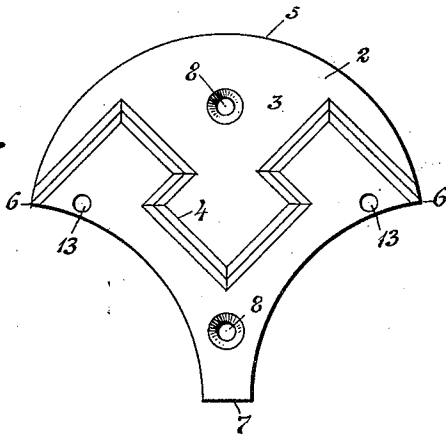
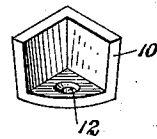


Fig. 4.



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DIE FOR INTERLOCKED SECTIONAL FLOORING.

999,844.

Specification of Letters Patent.

Patented Aug. 8, 1911.

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To all whom it may concern:

Be it known that I, AXEL W. NILSSON, a citizen of the United States, and a resident of Port Washington, county of Nassau, and State of New York, have invented certain new and useful Improvements in Dies for Interlocked Sectional Flooring, of which the following is a specification.

My invention relates to a die for cutting sections such as are commonly used for floor covering; such dies are usually made of some yielding or semi-yielding material such as *e. g.*, rubber, fiber, or some of the many composition substitutes for these or other materials. Sections, such as here referred to may also be used to cover walls and ceilings, as well as in other situations where a special covering is desirable for purposes of ornamentation, sanitation and the like.

The object of my invention is to provide a die which can be made quickly and at a reasonable cost, and which shall be capable of cutting such sections of any desired size and outline with absolute accuracy.

A further object of my invention is to provide a die such that any worn or damaged part can be quickly and easily replaced or repaired at small cost.

Another object of my invention is to provide a die capable of cutting a number of such sections of identical shape and size and with no substantial waste.

Still another and most important object of my invention is to provide a die which shall cut a number of interlocking but separable sections at one operation and without substantial waste.

Further objects of my invention will appear as the specification proceeds.

Dies arranged to cut a number of duplicate sections or a number of interlocking sections at one operation could easily be made along the lines well known in the prior art as appropriate for dies adapted to cut a single section. To so make such dies would merely require combining and attaching to one die holder as many separate dies as the number of sections to be struck out at one operation. But such dies would necessarily involve waste of material cut and, furthermore, each individual die would require to be made very accurately and exactly like every other die. Damage to a single die,

also, would require the substitution of an entire new die. The difficulties of making such an integral composite die also would be almost insuperable owing to the practical impossibility of hardening dies of large size without cracking or warping, while the cost would be prohibitive.

In making my improved die I may choose any desired four sided section, as the section to be cut provided only that the contour of each side is the same while as to one pair of opposite sides the contours are reversed compared with the other pair. I then construct a number of individual or unit dies each one of which is exactly like every other one and embodies the cutter or blade necessary to cut one side of the section. Each cutter is fixed to one of a number of identical unit backs and each of these backs is then removably attached to a main die support. The contour of the unit backs is so chosen that said backs can only be assembled in one definite way upon the main die support and when so arranged the several cutters will be found to be so related to one another that a number of identical sections will necessarily result from the operation of the die; and if the contour of the section side is provided with locking elements then the resultant sections will be interlocking sections as well as duplicate sections.

Referring to the drawings accompanying this specification, which are hereby made a part thereof, I have illustrated a die arranged according to my invention to strike out six interlocking sections of the design shown and claimed by me in U. S. Patent No. 40201 dated August 3, 1909.

Figure 1 is a sectional representation of the die taken along the line 1—1 of Fig. 2; Fig. 2 is a plan view, taken from below, of the complete die; Fig. 3 is an enlarged plan view of one of the unit dies shown in Fig. 2; and Fig. 4 is a perspective view, also enlarged, of one of the tie angles, as I have termed them, which I employ to help stiffen the completed die as well as in attaching the unit dies to the main die support.

Considering the drawings in detail, 1 is the main die support or back of metal and 2 the unit die, of which a number are adapted to be attached to and supported by the die support. Each of these unit dies is, as previously stated, identical with every other

unit die and comprises a unit back 3 provided with a cutter 4, fixed to the lower side thereof.

The unit backs 3 are given a shape which perhaps may best be referred to as "kite shaped." This shape is readily determined by striking an arc 5 of a circle through each pair of points 6, 6 belonging to the equal sides of the various sections as they would be outlined before separating. The radius of circle employed is immaterial provided the circle be so chosen that the entire cutter corresponding to a single section side is comprised within the contour line of a single unit back. When the arcs 5, 5 have all been struck, lines 7, 7 should be struck midway between each pair of arcs 5, 5 to form the base of the kite and completing the unit back. Instead of an arc 5 any other symmetrical contour line might be used between the points 6, 6 whether said line be curved or made up of straight lines; or, a line made up of a number of curved lines of the same or diverse curvature might be employed. The sole requirement is that the line 5 must not divide the cutter corresponding to an entire section side. But I prefer a circular arc as illustrated in the drawings by reason of the greater ease with which it may be accurately struck and duplicated in metal.

Each cutter 4 is preferably welded in a roughed out form to its unit back 3 and is then accurately worked up by the usual machine or hand methods or both into its final form; it has preferably a wedge section, being quite heavy at the base where it joins the unit back and tapering to a keen cutting edge. The depth of the cutter (distance from cutting edge to unit back) will, obviously, be determined by the maximum thickness of the material which is to be cut. After the cutter is brought to its final shape it may be hardened in any usual way and then, if desired, ground. In locating the several cutters upon their unit backs and bringing them to final size, a gage may be used and should be used to insure the required accuracy. Each finished unit die is provided with holes 8, 8 arranged to register with suitably located holes in the main die support and machine screws 9, 9 are then used to hold the entire structure together.

After the die has been assembled as just described I apply a tie angle 10 at every point 6 where the cutters corresponding to different section sides meet. Machine screws 11 which pass through holes 12 and 13 in the tie angles 10 and unit back 2 and have threaded engagement with the main die support 1 serve to hold the tie angles in position and to prevent any possible "chattering" of the individual unit dies near the points 6. The number of unit dies which may thus be combined together and operated as one die and hence the number of sections which may

be struck out at one operation need only be limited by the reasonable requirements of general machine construction such as *e.g.*, power available, best size of press, convenience of handling completed die, etc., as also by the dimensions of the sheets of material from which the sections are to be made.

The individual unit dies being relatively small and simple, are easily made and at a comparatively small cost. Being small they are not liable to warp seriously in hardening and such warping as may occur can be easily corrected. If the warping be serious the entire unit die may be scrapped without much loss. Also in using my improved die should any of the cutters break or wear unduly, the particular unit die at fault may be removed in a few moments' time and replaced by another. Extra unit dies should, of course, be kept on hand ready for such emergencies.

In the claims which follow and which are intended to definitely define my invention, I intend the words "floor covering" to signify, as already indicated above in the descriptive part, any sectional covering of the general type described and applicable to similar or analogous uses.

I claim—

1. A die for cutting sectional floor covering comprising a plurality of identical cutters removably attached to a common base and arranged along two sets of parallel direction lines the lines of each set being equi-distant from one another and the sets being disposed at right angles to one another, the cutters themselves being arranged so that those adjacent in each line are alternately reversed as to one another, substantially as and for the purpose described.

2. A die for cutting sectional floor covering comprising a plurality of identical cutters removably attached to a common base and arranged along a plurality of parallel direction lines so that adjacent cutters along the same line and opposite cutters in neighboring lines are alternately reversed as to one another, substantially as and for the purpose described.

3. A die for cutting sectional floor covering comprising a plurality of identical cutters removably attached to a common base and arranged along two sets of parallel direction lines, said sets being disposed at right angles to one another and the cutters themselves being so arranged that adjacent cutters along the same line and opposite cutters in neighboring lines are alternately reversed as to one another, substantially as and for the purpose described.

4. A die for cutting sectional floor covering comprising a plurality of identical cutters removably attached to a common base and arranged along two sets of parallel direction lines, said sets being disposed to intersect one another at right angles and the

cutters of each set lying wholly between the cutters of the other set thus forming a plurality of rectangularly arranged cutting groups, adjacent cutters constituting a single group being alternately reversed as to the space within the group, substantially as and for the purpose described.

5 5. A die for cutting a plurality of cover sections at one operation said die comprising a plurality of identical cutters fixed to and similarly disposed upon a plurality of unit backs so as to have a single cutter to each unit back, a main die support, and means including tie angles at the intersection of the cutters for supporting said unit backs upon said main die support, substantially as and for the purpose described.

6. In combination in a die for cutting a plurality of cover sections, a plurality of unit dies each comprising an identical cutter fixed to and similarly disposed upon an identical unit back, a main die support, and means for securing said unit dies to said main die support so that the ends of cutters will be in juxtaposition to form the corners of said cover sections, substantially as and for the purpose described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

AXEL W. NILSSON.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."