Aug. 26, 1952 F. L. MITCHELL 2,608,255

CUTTER DEVICE FOR COMPOSITION FLOOR TILES

Filed July 6, 1950 2 SHEETS—SHEET 1

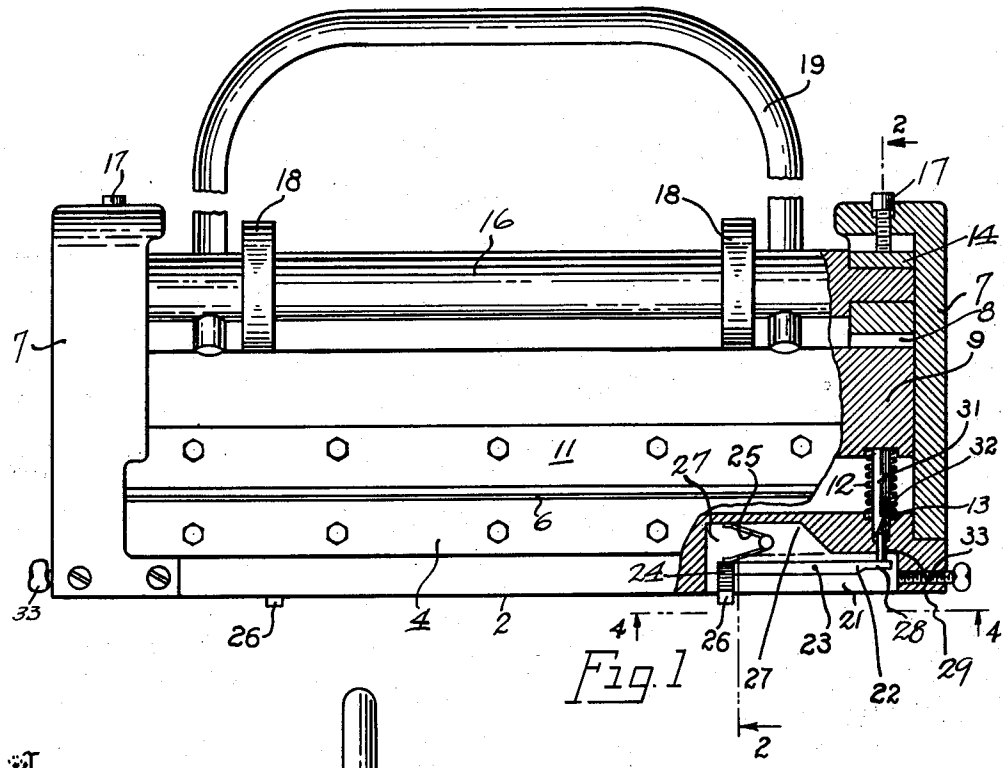


Fig. 1

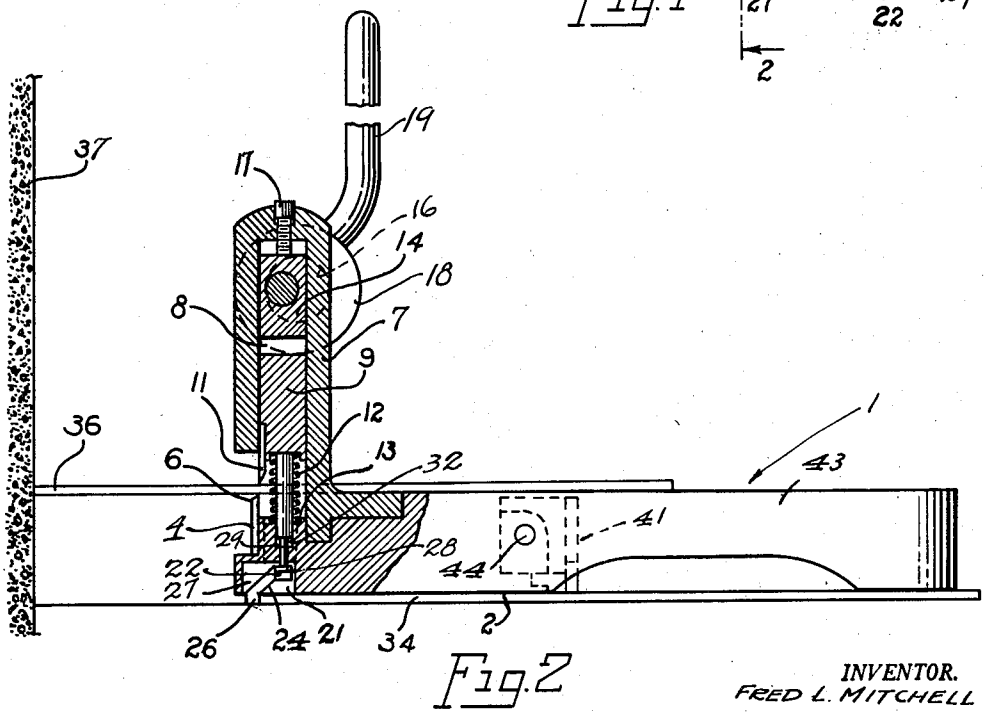


Fig. 2

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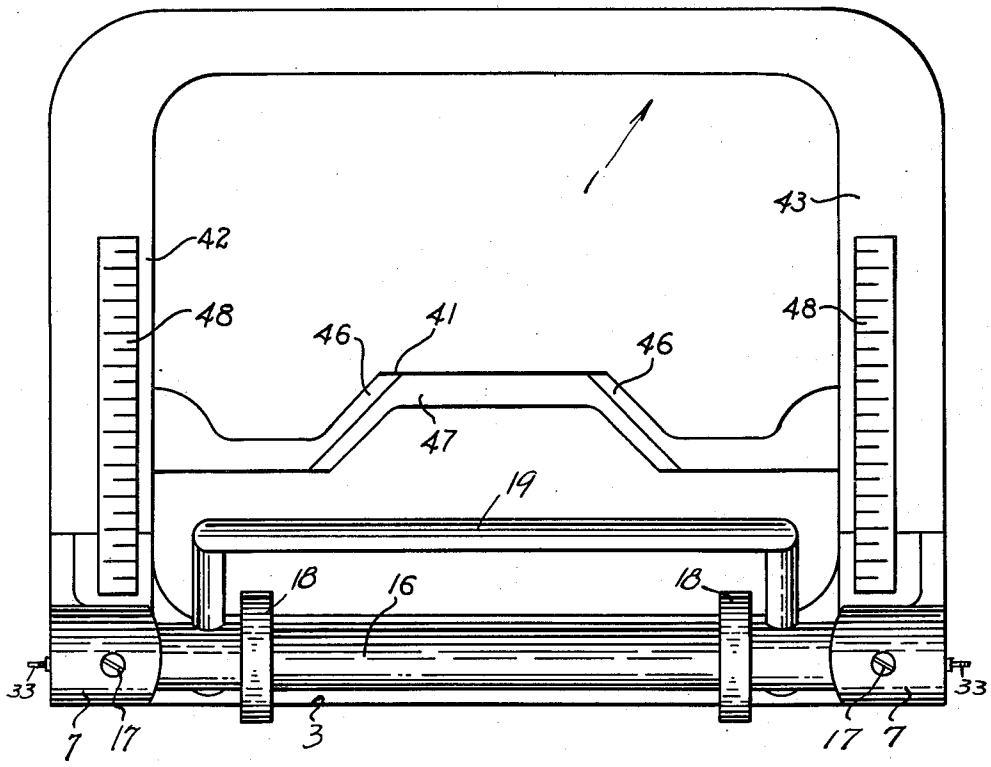


Fig. 3

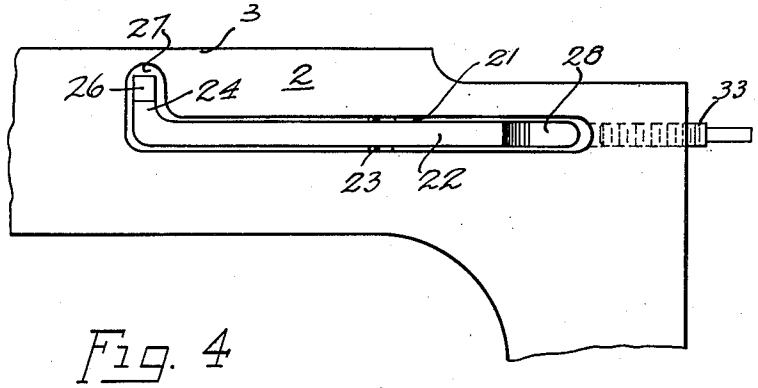


Fig. 4

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CUTTER DEVICE FOR COMPOSITION FLOOR TILES

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7 Claims. (Cl. 164—57)

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This invention relates to a cutter for resilient composition floor tiles, such as so called asphalt tiles, rubber tiles, linoleum tiles, plastic floor tiles and the like.

In laying resilient composition tiles, commonly called asphalt tiles, rubber tiles and the like, as a floor covering upon a surface, a problem arises near the boundaries of the area to be covered. There are certain corners or edges or other parts of the area where the surface or margin remaining is either of irregular shape or irregular size, namely it is of a different shape and size than that of the regulation tile used. For instance, most frequently asphalt tiles are furnished in generally rectangular outline and after an adhesive composition is spread upon the floor, the asphalt tiles are laid edge to edge. Near a wall or a corner or at any irregular projection onto the floor area, it is necessary to cut a tile to the shape of the uncovered marginal area. The manual methods used in the past are very tedious and involve both waste of material and labor.

The primary object of my invention is to provide a cutter wherein a tile can be accurately fitted in shape and size to a marginal or other area quickly and efficiently, without necessitating any elaborate measurements or adjustments.

The features of my cutter for asphalt tiles include: a light device the base of which is provided with an aligning abutment for automatic engagement with the edge of a field tile on the floor for determining the exact shape of a border tile which is to be cut to fit into the area between the tile on the floor and an adjacent wall or boundary; the facile holding of the tile to be cut against the boundaries of the surface to be fitted, for instance, against a wall, so that the relative alignment between the abutments of the device and of the edge of the tile against the wall accurately and instantaneously determines the shape and size to which the tile is to be cut to fit into the irregular area or space; the provision of cutting blades in registry with the aligning abutments of the device to accurately cut a tile so as to fit against the edge of the adjacent tile as well as against the boundary of the wall; the provision of a device for automatically raising the abutments when the cutting blades are moved together, so as to allow the sliding of the device without the abutments scratching or soiling the floor or the adjacent tile surface; the adjustability of the stroke of the cutter; and a measuring device and protractor for cutting tiles at predetermined suitable angles and sizes.

I am aware that some changes may be made

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in the general arrangements and combinations of the several devices and parts, as well as in the details of the construction thereof without departing from the scope of the present invention as set forth in the following specification, and as defined in the following claims; hence I do not limit my invention to the exact arrangements and combinations of the said device and parts as described in the said specification, nor do I confine myself to the exact details of the construction of the said parts as illustrated in the accompanying drawings.

With the foregoing and other objects in view, which will be made manifest in the following detailed description, reference is had to the accompanying drawings for the illustrative embodiment of the invention, wherein:

Fig. 1 is a front view of a cutter partly in section.

Fig. 2 is a side view of the cutter partly in section illustrating the cutting operation adjacent a wall.

Fig. 3 is plane view of my cutter; and

Fig. 4 is a detail fragmental bottom plane view showing the abutment alignment in its recess.

In the illustrative embodiment of my cutter I use a generally rectangular base frame 1. It is preferable that this base frame 1 be a skeleton frame composed of four suitably designed sides which have aligned bottom surfaces 2 so that the frame may be laid upon a tile in true position parallel with the plane of the flooring.

A front cross member 3 of the base frame 1 has on it a fixed shearing blade 4 with its cutting edge 6 extended upward above the top of the cross member 3.

At the opposite ends or corners of the cross member 3 are upwardly extended guide and bearing brackets 7 suitably aligned with one another. Each bearing bracket 7 has a vertical guide channel 8 open toward the other bracket 7. In the guide channels 8 are slidable the respective ends of a blade holder bar 9. A movable shearing blade 11 is carried on the movable bar 9 so that the upper movable blade 11 has its cutting edge in shearing alignment with the cutting edge 6 of the lower blade 4.

The blade holder bar 9 is moved downward for the cutting operation against the retarding action of a coil spring 12 under each end of the bar 9 in each bracket 8. The lower end of each coil spring 12 bears against a suitable recess 13 in the top of the front cross member 3.

In each bearing bracket channel 8 and above the adjacent end of the blade holder bar 9 is

slidable a bearing block 14. The ends of a camshaft 16 are journalled in the opposite bearing blocks 14. The upward movement of the bearing blocks 14 is adjustably limited by a suitable set screw 17 threaded in the top of each bearing bracket 7 and extending downwardly against the top of the respective bearing block 14. On the camshaft 16 are a pair of eccentric cams 18 spaced from one another, and bearing against the top of the blade holder bar 9. A suitable handle yoke 19 is extended from spaced points of the camshaft 16, in the present illustration substantially in U-shaped form.

Thus by inserting a tile between the blades 4 and 11 and above the frame 2 and then by turning the handle yoke 19 in a clockwise direction viewing Fig. 2, the eccentric cams 18 force the blade holder 9 and the blade 11 downwardly so that the cutting edge of the blade 11 passes the cutting edge 6 of the other blade 4, and accurately cuts the tile on the cutting lines of the blades. When the handle 19 is turned upwardly, in contra clockwise direction, viewing Fig. 2, the action of the springs 12 will urge the blade holder 9 and upper blade 11 upwardly to follow the cams 18 and return to the initial position ready for the next cutting operation.

For the purpose of correctly aligning the cutting edges of the blades 4 and 11 with an edge of a tile already laid on a floor, so as to cut another tile accurately complemental to the first laid tile, an aligning abutting device is provided in the ends of the bottom of the front cross member 3. A longitudinal recess 21 is provided in each end and in the bottom of the cross member 3. Each recess has in it a pivoted lever 22 the pivot 23 of which is substantially intermediate between the ends of the lever 22 and provides a horizontal pivot axis. On the inner end of each lever 22 is provided a forwardly extended and downwardly inclined abutting arm 24. On the lower end of the abutting arm 24 is a vertical aligning and abutting finger 26 which is accurately aligned with the cutting plane of the cutting blades 4 and 11. When the fingers 26 abut against the edges of the tile on the floor, then the line of cutting between the blades 4 and 11 is also accurately aligned with the adjacent edge of said tile on the floor.

In a pocket 27 at the inner end of the recess 21 is provided a suitable spring 25 which bears against the adjacent inner end of the lever 22 to normally urge the inner end of the lever and the abutting finger 26 downwardly and out of the recess 21. The outer end 28 of the lever 22 bears against a reduced end 29 of a vertical pin 31 which extends downwardly from each end of the blade holder 9 and through the coil spring 12. The pin 31 moves in a hole 32 downwardly whenever the blade holder 9 is moved downward for the cutting operation. The adjustment and relative proportions of the pin 31 and the hole 32 and the abutting and aligning device is such that while the handle 19 is turned so as to press the blade holder 9 and the upper blade 11 for the shearing and cutting operation, the lower end 29 of the pin 31 is pressed down against the outer end 28 of the lever 22 and thereby lifts up and conceals said finger 26 in the recess 21, in an out of the way position.

In the present illustration when the handle 19 is turned down and the end 28 of the lever 22 is depressed by the pin 29, then the set screw 33 can be extended inwardly above the outer end of the lever 22 and the latter will be held in that position during all subsequent operations, until the set screw 33 is again unscrewed.

In operation the cutter frame 1 is placed upon the tile 34 nearest to the boundary or irregular outline, the device is set to the edge of this tile 34 and the device is adjusted so that both fingers 26 are in abutment with the adjacent edge of the tile 34. In this position another tile 36 of sufficient size is inserted through the space between the blades 4 and 11 as particularly shown in Fig. 2. The inserted tile 36 is held loosely so that its outer edge can align with the surface of the adjacent wall 37 as shown in Fig. 2. In this manner the exact distance between the wall 37 and the edge of the first tile 34 on the floor is measured and the tile 36 is cut in an exact duplicate of that measurement because it is between the wall 37 and the cutting edges of the blades 6 and 11, and because the abutment sides of the fingers 26 are in alignment with the cutting plane of the blades 6 and 11. After the inserted tile 36 is pressed into contact with the wall 37, the handle yoke 19 is turned in a clockwise direction viewing Fig. 2 and the blades 6 and 11 cut the inserted tile 36 exactly to the shape and size fitting between the wall 37 and the edge of the tile 34 on the floor. While the handle yoke 19 is in its depressed position, and the fingers 26 are correspondently concealed the device is slid off the edge of the tile 34 and the accurately cut piece of the tile 36 can be dropped in place. In the event the wall is at an angle to the adjacent edge of the field tile on the floor the inserted tile to be cut is preferably inserted upside down so that after cutting it can be inverted and dropped in place with its side edges in line with the side edges of the field tile. The accuracy of this cut is easily accomplished whether the wall 37 is parallel with the edge of the first tile 34 or whether it provides a converging or diverging outline or space on the floor. The angle is reproduced by the adjustment of the loose tile 36 in the device between the blades 6 and 11 and the wall 37.

A protractor 41 is supported between the opposite sides 42 and 43 of the frame 1 on stub shafts 44, arranged eccentrically with the respect to the protractor 41 so that when the protractor is turned in a clockwise direction viewing Fig. 2 it will be concealed between the members of the frame 1 and below the top level thereof. The protractor 41 consists of a member which extends across the frame 1 and has a pair of converging angular alignment walls 46 at suitable angle, preferably at right angles to one another, between which a corner of an inserted tile 36 can rest. As the tile 36 is adjusted in the manner shown in Fig. 2, the protractor is in an out of way position to allow free adjustment of the tile according to the distance of the wall 37. When it is desired to cut a tile to a particular angle, then a corner of the tile can be placed in the protractor 41 between the walls 46 thereof and then the corner of the tile can be cut off accurately. This performs a particular type of so called miter cut on the tile for certain installations.

If it is desired to cut a tile of a given width of strip, then the tile can be aligned according to scales or graduations 48 provided longitudinally upon the opposite sides 42 and 43, graduated to indicate the distance from the cutting edges of the blades 6 and 11 and thereby allowing accurate cutting of the tile to any width or at desired angle.

The device is simple and light in structure. It can be easily slid along the surface of the tile already laid, yet it will almost automatically align with the edge of the outermost laid tile so as to permit the easy measuring and cutting of a tile to fit between the last laid tile and the adjacent boundary or wall. A quick cutting operation can be performed and the device can be easily moved to the next cutting position without lifting up the device or without spreading any dirt on or scratching the surface of the tile laid.

The device is flexible and easily conforms for the various contours of cutting desired. It is simple to operate and it will operate on all tiles adapted for cutting by shearing blades of this type. It is to be understood that in using the term "tile" applicant has reference to the so called resilient composition floor tiles such as so called asphalt tiles, rubber tiles, linoleum tiles, plastic floor tiles, and the like, which are made of a suitable composition for floor covering and which are adapted to be cut by shears into desired shape and forms.

I claim:

1. In a cutting device for resilient tiles and the like, a frame, a pair of cutting blades mounted on said frame and spaced to permit the insertion of a tile therebetween, means on the frame to move said cutting blades together for cutting the inserted tile therebetween, and an aligning device on the frame adapted to abut against the edge of a tile on the floor, said aligning device including a lever pivoted on the frame, an abutting finger extended from said lever in vertical alignment with the cutting edges of the blades, resiliently yieldable means to urge said finger downwardly to below the frame, and a connection between said lever and the moving means for said blade to turn said lever for moving said finger upwardly when the blades are moved together for cutting a tile.

2. A resilient floor tile cutting device comprising a base frame, a blade mounted across a side of said base frame, another blade movably supported on said frame opposite the first blade, means for vertically moving said second blade toward said first blade for cutting a tile inserted between the blades, an abutting element extending from the underside of said base and aligned vertically with the cutting edges of said blades and being adapted to align with the edge of a tile under said base frame.

3. In a resilient floor tile cutting device, a base frame, a pair of cutting blades held on said base frame, means to move said cutting blades together for cutting a tile therebetween, the space on both sides of said cutting blades being unobstructed for free adjustment of a tile inserted therebetween, and an abutment element extended from said base frame in vertical alignment with said cutting edges to align said cutting edges with the edge of a tile under said base frame.

4. In a resilient floor tile cutting device, a base frame, a pair of cutting blades held on said base frame, means to move said cutting blades together for cutting a tile therebetween, the space on both sides of said cutting blades being unobstructed for free adjustment of a tile inserted therebetween, and means on said base frame to align said cutting edges with the edge of a tile on a floor under said base frame, said aligning means including an abutment finger, means to resiliently urge said abutment finger downwardly below the level of said base frame in vertical alignment with said cutting edges, and a device actuated by the cutting motion of said blades to raise said finger inwardly of said base frame when said blades are moved into cutting position.

5. In a resilient floor tile cutting device, a base frame, a pair of cutting blades held on said base frame, means to move said cutting blades together for cutting a tile therebetween, the space on both sides of said cutting blades being unobstructed for free adjustment of a tile inserted therebetween, and means on said base frame to align said cutting edges with the edge of a tile on a floor under said base frame, said aligning means including an abutment finger, means to resiliently urge said abutment finger downwardly below the level of said base frame in vertical alignment with said cutting edges, a device actuated by the cutting motion of said blades to raise said finger inwardly of said base frame when said blades are moved into cutting position, and releasable means to fasten said aligning means in said concealed position.

6. In a cutting device for asphalt tiles, rubber tiles, linoleum tiles, plastic floor tiles, and the like, a generally horizontal frame, vertical brackets on the corners of a side of the frame, a cutting blade fixed on said side of the frame with its cutting edge facing upwardly, a movable cutting blade aligned with said fixed blade for cutting a tile inserted between the cutting edges of said blades, the cutting edges of said blades being parallel with said side of said frame, a blade supporting element for said movable blade being vertically reciprocable in said brackets at the ends thereof, means to reciprocate said supporting element in said brackets, a recess in the underside of each end of said side of said frame, a lever pivoted in each recess, an aligning element extending from an end of each lever toward the underside of said frame and in vertical alignment with the cutting edges of said blades, and means to urge said end of each lever and said aligning element downwardly and out of said recess for alignment with a tile under said frame.

7. In a cutting device for asphalt tiles, rubber tiles, linoleum tiles, plastic floor tiles and the like, a generally horizontal frame, vertical brackets on the corners of a side of the frame, a cutting blade fixed on said side of the frame with its cutting edge facing upwardly, a movable cutting blade aligned with said fixed blade for cutting a tile inserted between the cutting edges of said blades, the cutting edges of said blades being parallel with said side of said frame, a blade supporting element for said movable blade being vertically reciprocable in said brackets at the ends thereof, means to reciprocate said supporting element in said brackets, a recess in the underside of each end of said side of said frame, a lever pivoted in each recess, an aligning element extending from an end of each lever toward the underside of said frame and in vertical alignment with the cutting edges of said blades, means to urge said end of each lever and said aligning element downwardly and out of said recess for alignment with a tile under said frame, and connecting means between said blade supporting elements and said lever for withdrawing said aligning fingers into said recess when said blade supporting means is shifted downwardly into cutting position.

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No references cited.