March 31, 1964 D. H. PEDERSEN 3,126,929

POWER-OPERATED, HAND MANIPULATED BLOCK PLANE

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FIG.1.

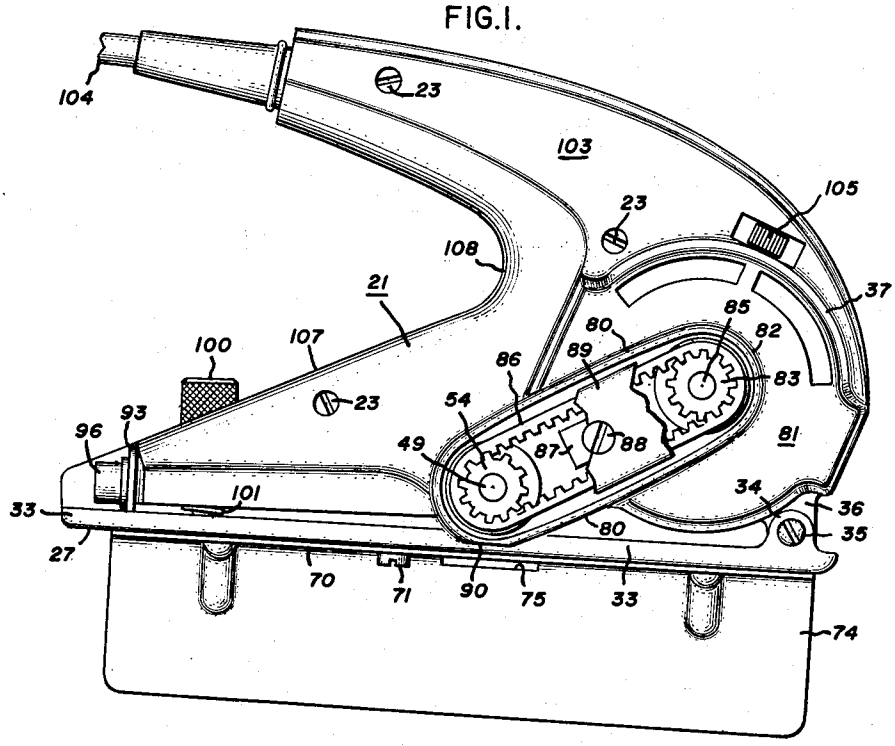
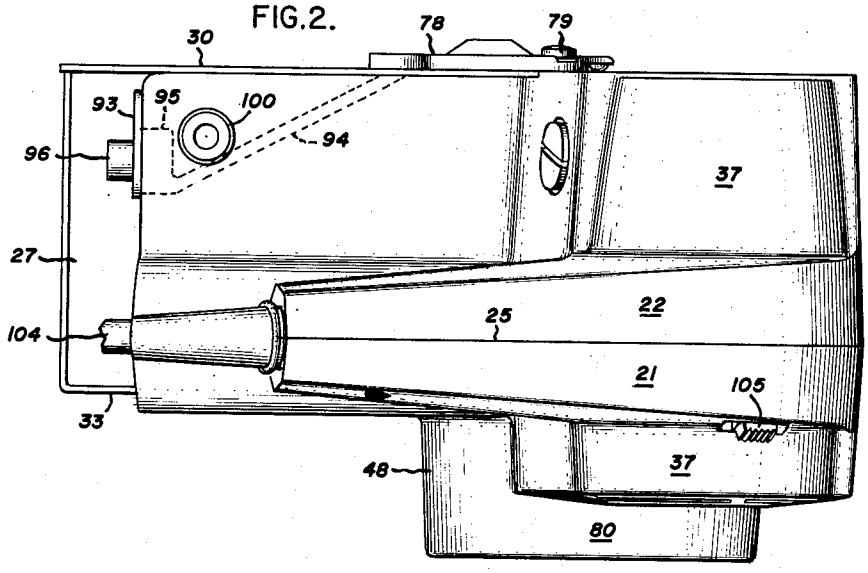


FIG.2.



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FIG.3.

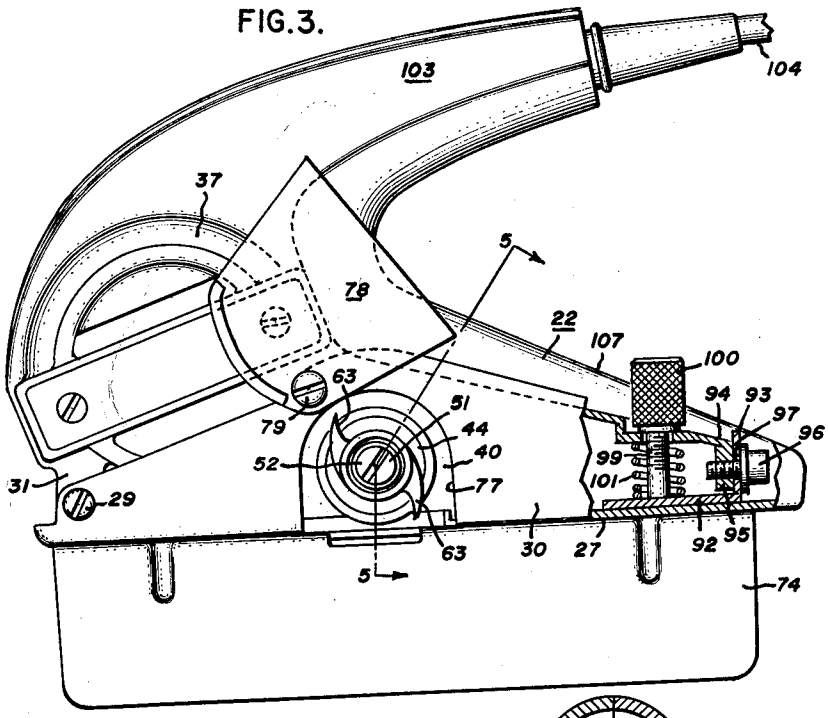


FIG.4.

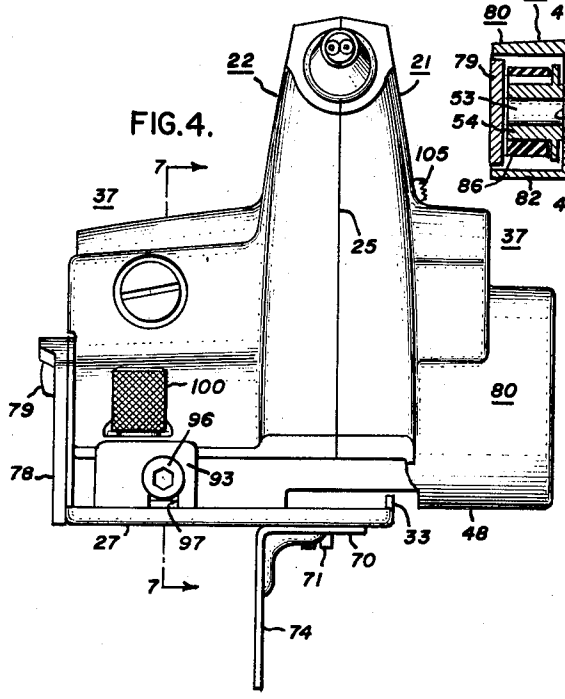


FIG.5.

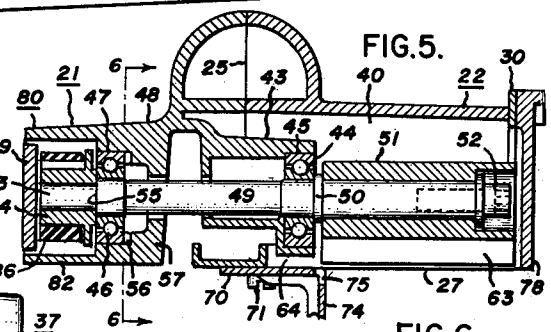
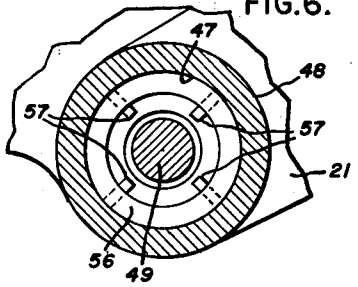


FIG.6.



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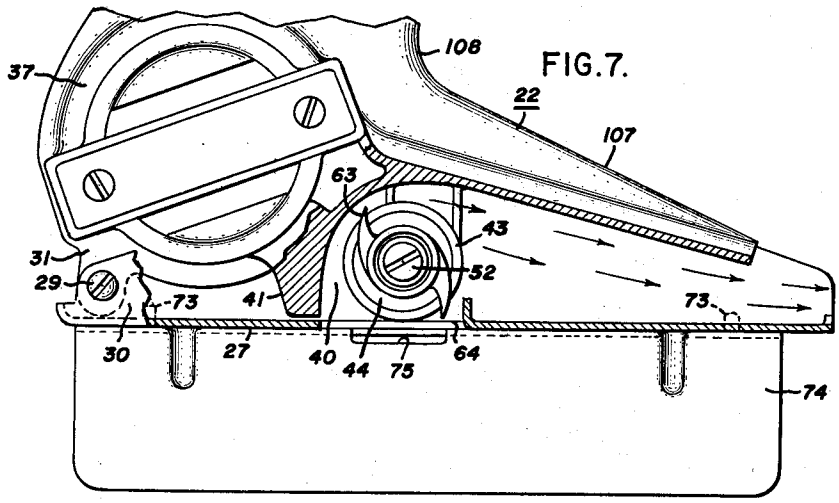


FIG.7.

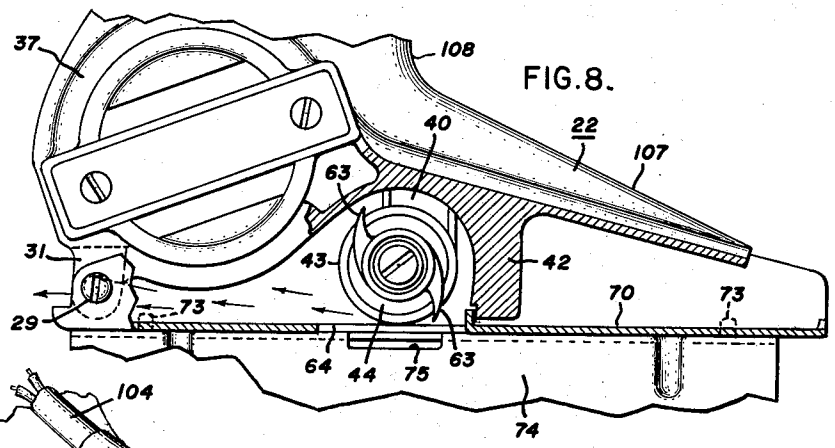


FIG.8.

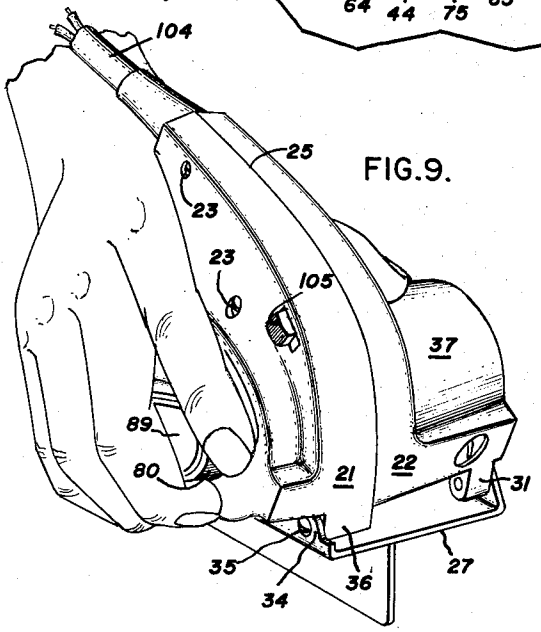


FIG.9.

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POWER-OPERATED, HAND MANIPULATED BLOCK PLANE

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Filed June 19, 1961, Ser. No. 118,107
3 Claims. (Cl. 145—4)

This invention relates to wood working planes and in particular to a power-operated, block plane. At the present time, portable, power-operated, planes are available in the larger sizes, such as jack planes and jointers. Such planes are of substantial size and weight, and require the use of both hands for their operation. They are therefore not adapted for work on small pieces, or for work in close quarters, and for free hand manipulation for spot planing. Also, such planes are expensive.

This invention has as an object a small, compact, power-operated, block plane embodying a structural arrangement, whereby the plane is conveniently grasped and held in the palm of the hand, the structural arrangement of the plane being such that the center of gravity is located to provide for convenient manipulation of the plane in a natural and effortless manner.

The invention consists in the novel features and in the combinations and constructions hereinafter set forth and claimed.

In describing this invention, reference is had to the accompanying drawings in which like characters designate corresponding parts in all the views.

In the drawings:

FIGURE 1 is a right-hand side elevational view of the plane embodying our invention, with a portion of the transmission compartmnet cover broken away.

FIGURE 2 is a top plan view of the plane.

FIGURE 3 is a left-hand, side elevational view with parts broken away and parts in section.

FIGURE 4 is a rear end elevational view.

FIGURE 5 is a view taken on line 5—5, FIGURE 3.

FIGURE 6 is an enlarged sectional view taken on line 6—6, FIGURE 5.

FIGURE 7 is a left side elevational view, with a major portion of the body and support shoe sectioned on a line corresponding to line 7—7, FIGURE 4, illustrating rearward chip discharge.

FIGURE 8 is a view, corresponding to FIGURE 7, illustrating forward chip discharge.

FIGURE 9 is a perspective view of the plane illustrating the manner in which it is grasped in the hand.

The plane consists generally of a body formed of a pair of metal castings secured together in mating relation. The body castings are formed with mating concavities to provide, at the forward end of the body, a motor compartment, and a cutter compartment located adjacent the rear lower portion of the motor compartment. The body is supported on an adjustable shoe. A cutter is journalled in the cutter compartment and extends through the bottom of the compartment and an opening formed in the shoe. A motor mounted in the motor compartment is operatively connected to the cutter by a cog belt operating in a transmission compartment which extends laterally from the right side of the body and inclines upwardly from the cutter compartment to the central portion of the right end wall of the motor compartment. The rear portion of the body is inclined upwardly and merges with a projection, in the form of a handle, extending rearwardly from the upper portion of the motor compartment. The formation of the top wall of the body, the location of the handle projection, the location and form of the transmission cmpartment all

coperating to provide for the plane being cnveniently grasped in the right hand of the user.

The right hand body casting 21 abuts against the left hand casting 22 and is secured thereto as by screws 23 extending through one body casting and threading into the other, the castings having abutting planar surfaces meeting on a line 25.

A supporting shoe 27 is pivotally connected at its forward end to the forward end of the body. This connection is by way of a screw 29 extending through a vertically disposed flange 30 of the shoe, overlying the left side of the body, and threading into a boss 31 formed at the forward end of the left body casting 22. The right edge of the shoe 27 is turned upwardly to provide a short vertical flange 33, the forward end of which is formed with an ear 34 through which a screw 35 extends, and which is threaded into a boss 36 formed at the forward end of the body side casting 21.

The forward portions of the body castings are formed with mating concavities providing a substantially cylindrical motor compartment 37 extending transversely of the body.

The left-hand casting 22 is formed with a cutter compartment 40 adjacent to and rearwardly of the motor compartment. The cutter compartment is open at the bottom and has either a front side wall 41, FIGURE 7, or a rear side wall 42, FIGURE 8.

The right-hand body casting 21 is formed with a cylindrical hub 43, see FIGURE 5, extending into the cutter compartment 40. The outer end of the hub is bored to receive an antifriction bearing 44, the outer race of which is positioned against a shoulder 45. A second bearing 46 is mounted in a bore 47 formed in a boss 48 extending laterally from the side wall of the body casting 21. A cutter arbor shaft 49 is journalled in the bearings 44, 46. The arbor extends outwardly from the bearing 44 in the cutter compartment 40 and is formed with a collar or enlarged portion 50 abutting against the outer end of the inner race of the bearing. A cutter 51 is mounted on this outwardly extending portion of the arbor shaft and is fixed thereto, as by a screw 52, the head of which is mounted in a counterbored recess formed in the outer end of the cutter.

The arbor shaft 49 is formed with a portion 53 of reduced diameter on which there is fixedly mounted a cog belt pulley 54, as by being threaded thereon, the inner end of the pulley abutting against the shoulder 55 and the outer end of the inner race of the bearing 46. The outer race of this bearing is seated against a ring member 56 formed of resilient material, such as neoprene. The ring 56 is, in turn, seated upon a plurality of radially disposed ribs or ledges 57 formed in the bottom of the bore 47 in which the bearing is mounted.

In FIGURE 6, there are four of the ledges 57 shown spaced circumferentially apart. The purpose of the resilient ring 56 is to provide a resilient seat for the outer race of the bearing 46 yieldingly urging the same outwardly to position the outer race of the bearing 44 against the shoulder 45. This resilient seat 56 effects proper preloading of the bearings 44, 46, with liberal tolerances in the machining of the casting 21 and the arbor 49. The ledges 57 permit the yieldable seat 56 to readily deform and to prevent rotation of the seat and, because of its frictional engagement with the outer race of the bearing 46, prevents rotation of said outer race.

The cutter 51 is formed with two or more lips or cutting edges 63 which extend radially from the axis of the arbor shaft 49 through the open bottom of the cutter compartment, and through an opening 64 formed in the shoe 27 immediately below the cutter. An angle plate is positioned with a leg 70 against the underside of the shoe 27 and is detachably secured thereto by a screw 71 threaded

into the shoe. The leg 70 of the angle plate is formed with a pair of projections 73, see FIGURE 7, positioned in apertures formed in the shoe to properly locate the plate when attached by the screw 71. The leg 74 of the angle plate depends from the shoe 27 and is perpendicular thereto, the leg 74 forming a guide overhanging the edge or side of the workpiece being planed. The leg 70 and the vertical leg 74 are formed with a notch 75 located centrally of the opening 64 in the shoe. Because this notch also extends into the leg 70, the work engaging surface of the leg 74 is positioned slightly inwardly over the inner end of the cutter 51 to make certain that the piece being planed will be planed to the edge engaged by the leg portion 74 of the guide.

The upwardly extending flange 30 of the shoe 27 overlies the left side of the body, and the outer end of the cutter 51 is co-planar with the outer surface of the flange 30, whereby a surface may be planed perpendicular to a second surface, such as the rabbet along the edge of a board. The outer end of the cutter compartment 40 is open to provide for the mounting and replacement of the cutter 51 on the arbor shaft 49.

In like manner, the vertical side flange 30 of the shoe is provided with an opening 77. A closure 78 is provided for the opening 77 and is in the form of a plate pivotally mounted on a screw 79 threading into the flange 30. In FIGURE 3, the closure plate 78 is shown swung upwardly for access to the cutter compartment. The closure plate 78 is shown in the closed position, FIGURE 5.

The boss 48 is formed with laterally extending flanges 80 which incline upwardly in substantially parallel spaced relationship from the cutter compartment to the central portion of the right end plate 81 of the motor housing 37. These flanges are connected at their ends by a curved portion 82. These flanges 80, 82, form a transmission compartment with the cog belt pulley 54 being located in the lower portion of the transmission compartment, and a cog belt gear 83, fixed to the end of the motor shaft 85, is positioned in the upper end portion of the transmission compartment. An endless cog belt 86 is trained over the pulleys 54, 83, to provide means for operatively connecting the motor to the cutter arbor 49. There is a post 87, FIGURE 1, positioned in the central portion of the transmission compartment and is tapped to receive a screw 88 employed to detachably secure a cover 89 enclosing the pulleys and belt. The undersurface of the lower end of the transmission compartment is relieved, as at 90, in a plane slightly above the shoe 27. This permits surface planing on wide stock by removal of the guide 70, 74, from the shoe.

The shoe 27 is adjustable about its pivotal mounting screws 29, 35, toward and from the body of the plane for regulating the extent the cutting edges 63 of the cutter engage the work piece. That is, to vary the depth of the cut. An angle plate 92, FIGURE 3, is fixedly secured to the rear portion of the shoe 27 and has an upstanding flange 93. The left-hand body casting 22 is formed on its under side with a partition wall 94 extending inwardly from the left side of the body at the rear of the cutter compartment 40, see FIGURE 2. The rear end of the partition 94 is formed with a boss 95. The vertical flange 93 overlies the rear end of the boss 95. The boss is threaded to receive a screw 96 extending through a slot 97 formed in the flange 93.

A stud 99 is fixed to the plate 92 and extends upwardly through an aperture formed in the top wall of the body casting 22. An adjusting collar 100 is threaded on the upper end of the stud 99. A helical compression spring 101 is positioned on the stud 99 intermediate the plate 92 and the top wall of the body casting. With this arrangement, the screw 96 is loosened and the nut 100 turned to move the shoe 27 upwardly or downwardly. Tightening of the screw 96 holds the shoe in adjusted position.

The body castings are formed with mating projections 103 extending rearwardly from the upper portion of the motor compartment 37. These projections may take the form of a handle, to the rear end of which is attached the power cord 104 for supplying the motor with power through a switch having an actuator 105 available for manipulation by the forefinger of the right hand. The top wall 107 of the body inclines upwardly from the rear end thereof and merges on a concave surface 108, with the underside of the handle projection 103.

The handle projection 103 is arranged substantially in the vertical plane of the center of gravity of the machine. The transverse plane of the center of gravity being approximately at the screw 79. The transmission compartment 80 is spaced laterally relatively to the handle projection so that when the latter is straddled by the thumb and forefinger, the transmission compartment provides a grip surface encompassed by the second, third and fourth fingers of the right hand, see FIGURE 9. This structural arrangement provides for a natural and effortless grasp of the plane in the right hand of the user, which results in a natural and effortless manipulation, whereby small areas of the workpiece can be accurately planed.

What I claim is:

1. A power-operated, hand-manipulated, block plane comprising a body formed at its forward end with a transversely extending motor compartment, a projection extending rearwardly and inclining upwardly from the top wall of said compartment intermediate its ends, said projection being located substantially in the vertical plane of the center of gravity of said block plane, said body inclining upwardly from the rear end thereof and merging on a concave surface with the under surface of said projection, said projection extending rearwardly from said concave surface and a power cord attached to the rear end of said projection, said body being also formed with a transversely extending cutter compartment arranged in close adjacency to the lower rear portion of said motor compartment, a transmission compartment including a pair of walls extending in spaced parallel relation laterally from the right side of the body and inclining upwardly from said cutter compartment to the central area of the right end of said motor compartment, a motor mounted in said motor compartment and a cutter journalled in said cutter compartment on an axis extending transversely of the body, and motion transmitting means in said transmission compartment operatively connecting said motor to said cutter.

2. A power-operated, hand-manipulated, block plane comprising a body formed at its medial portion with a transversely extending cutter compartment open at the bottom, a motor compartment at the forward end of the body, the top surface of said body inclining upwardly from the rear end of the body and merging above said cutter compartment on a concave surface with a projection extending rearwardly from the upper part of said motor compartment intermediate the ends thereof, said projection being located substantially in the vertical plane of the center of gravity of the block plane, a transmission compartment extending laterally from the right side of the body and inclining upwardly from said cutter compartment at an angle of substantially 30° to the central area of the right-hand end of said motor compartment, a cutter journalled in said cutter compartment and having cutting edges extending through the open bottom thereof for engagement with the work piece, a motor mounted in said motor compartment and motion transmitting means in said transmission compartment operatively connecting said motor to said cutter.

3. A power-operated, hand-manipulated, block plane comprising a body formed at its forward end with a transversely extending motor compartment, said body being also formed in its medial portion with a cutter compartment extending transversely of the body below and adjacent the rear side of said motor compartment and being open at the bottom, a cutter journalled in said cutter

compartment for rotation about an axis extending lengthwise of the cutter compartment, said body inclining upwardly from the rear end thereof and merging above said cutter compartment on a concave surface with a projection located intermediate the ends of said motor compartment, said projection being arranged substantially in the vertical plane of the center of gravity of the block plane and extending rearwardly and inclining upwardly from the top wall of said motor compartment, a transmission compartment extending laterally from the right side of the body and inclining upwardly from said cutter compartment to the central area of the right end of said motor compartment, said transmission compartment being located to the right laterally from said projection to provide a grip area encompassed by the second, third and

fourth fingers of the right hand when said projection is straddled by the thumb and first finger, a motor mounted in said motor compartment and motion transmitting means in said transmission compartment operatively connecting said motor to said cutter.

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