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M. W. ODOM

2,653,354

COMB BOX MECHANISM

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FIG. 1

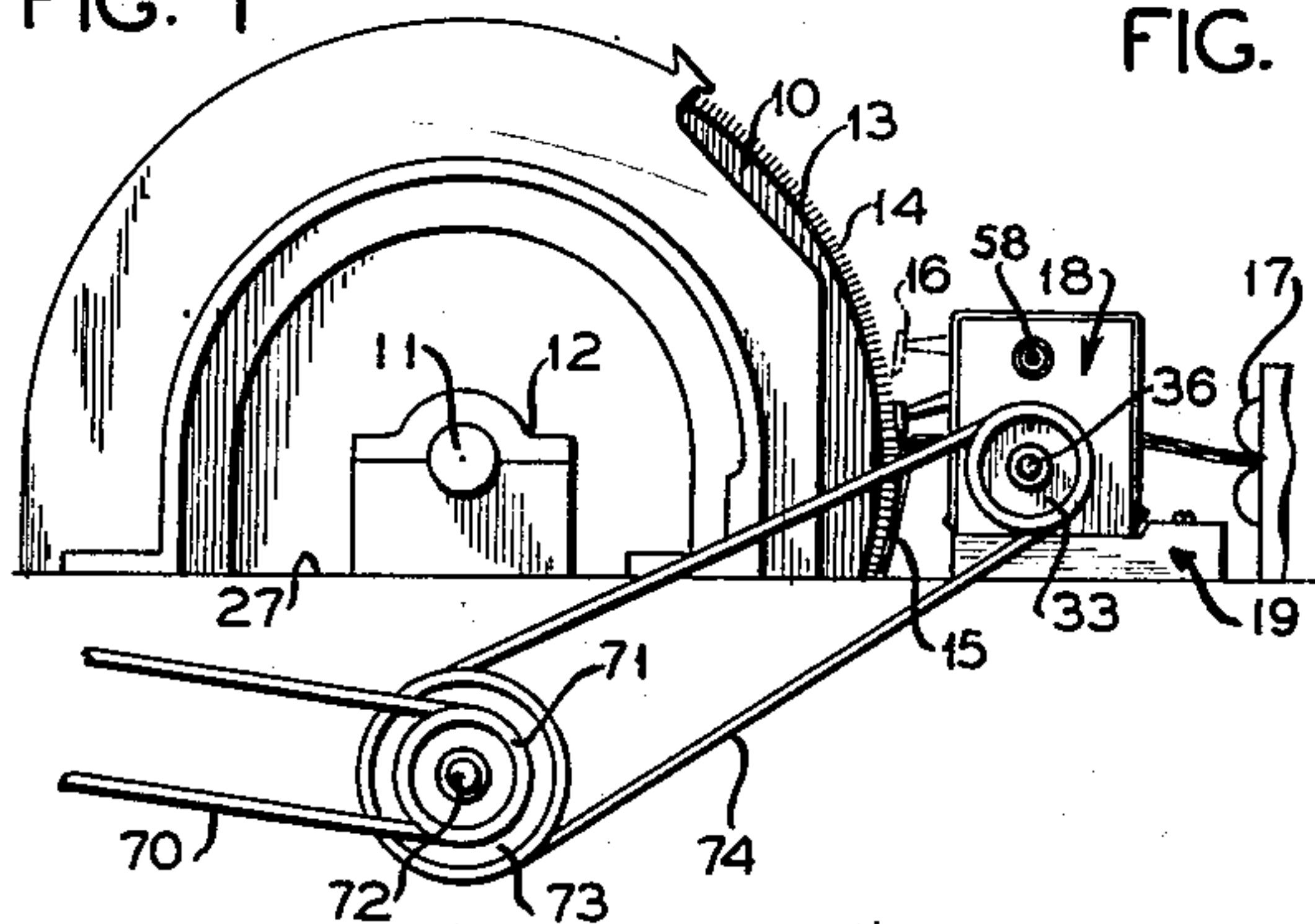


FIG. 2

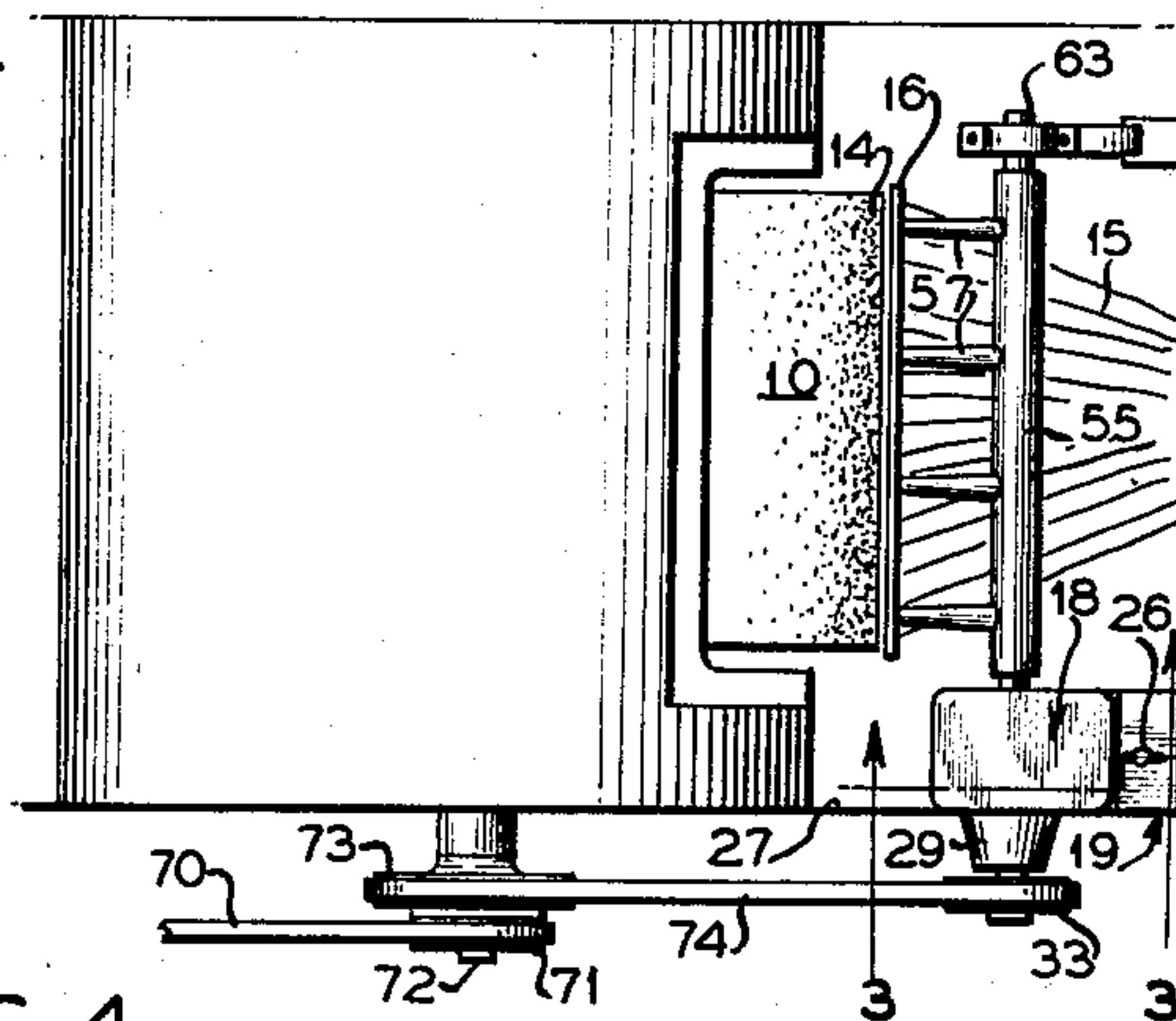


FIG. 3

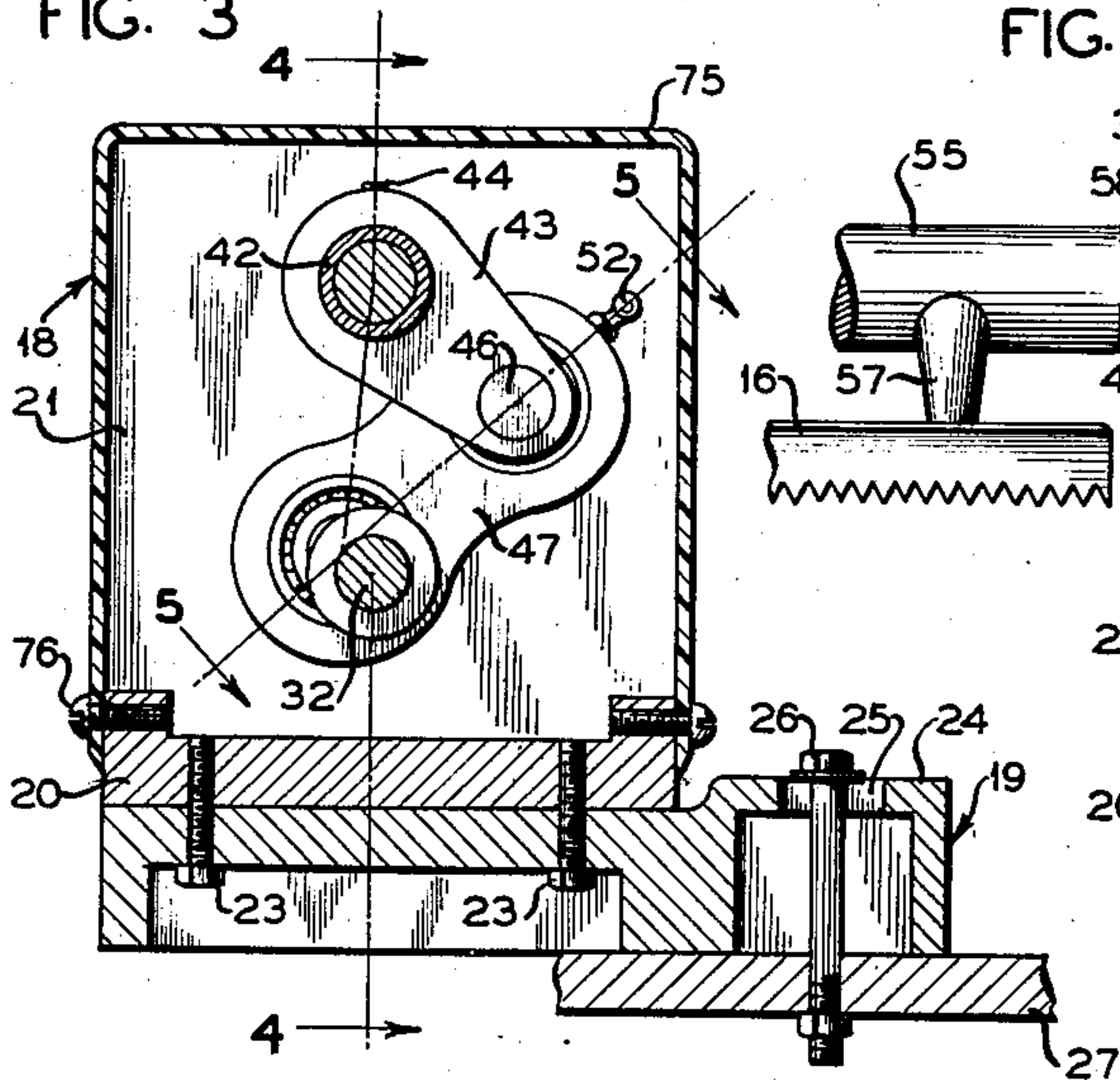


FIG. 4

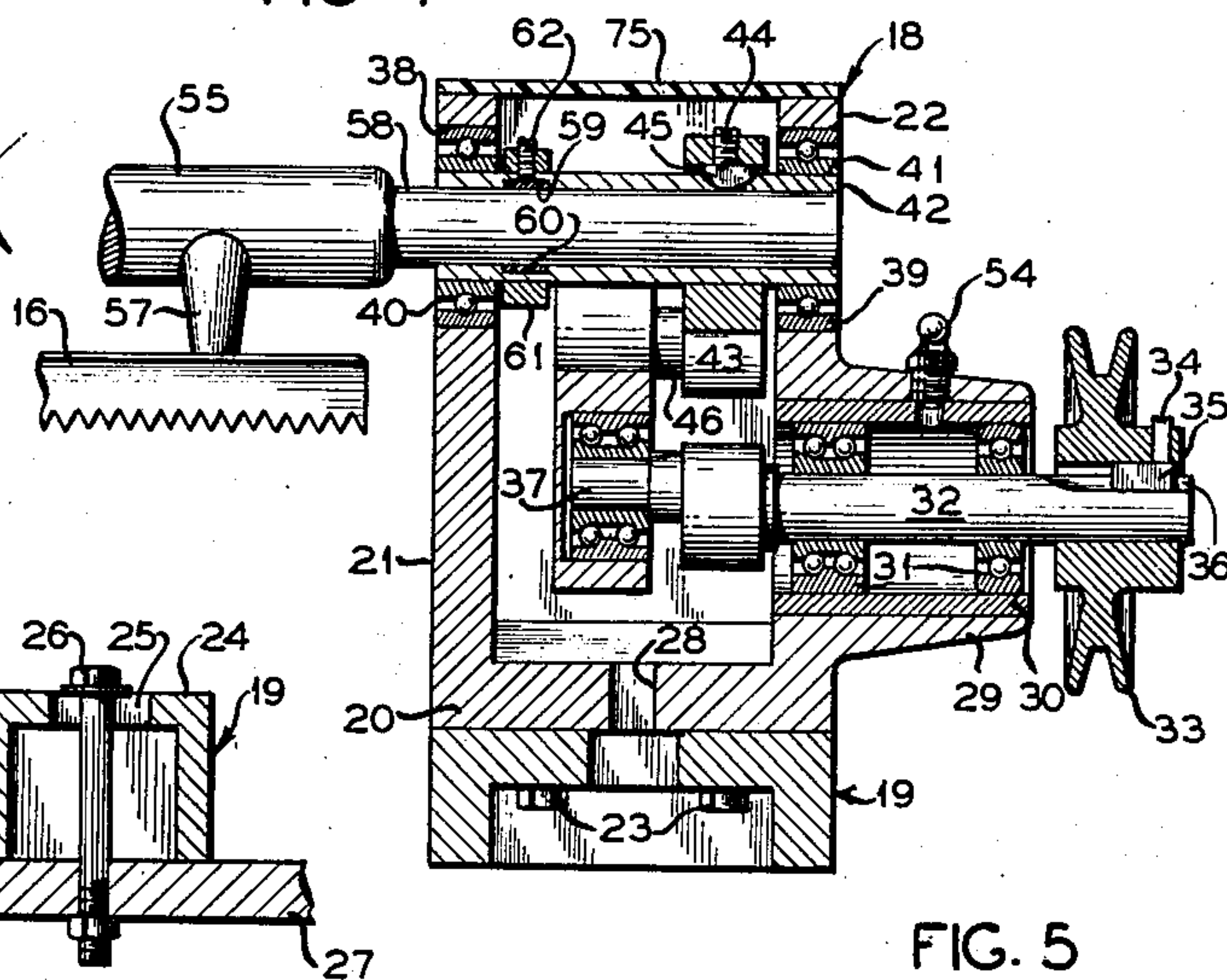


FIG. 5

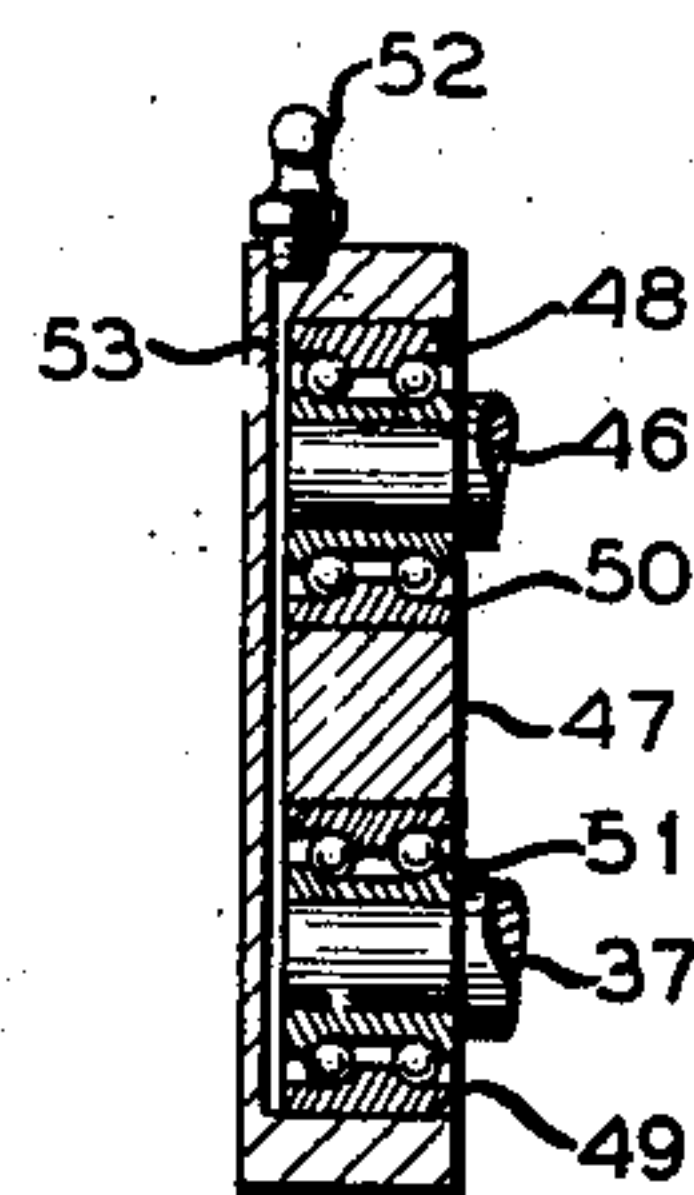


FIG. 6

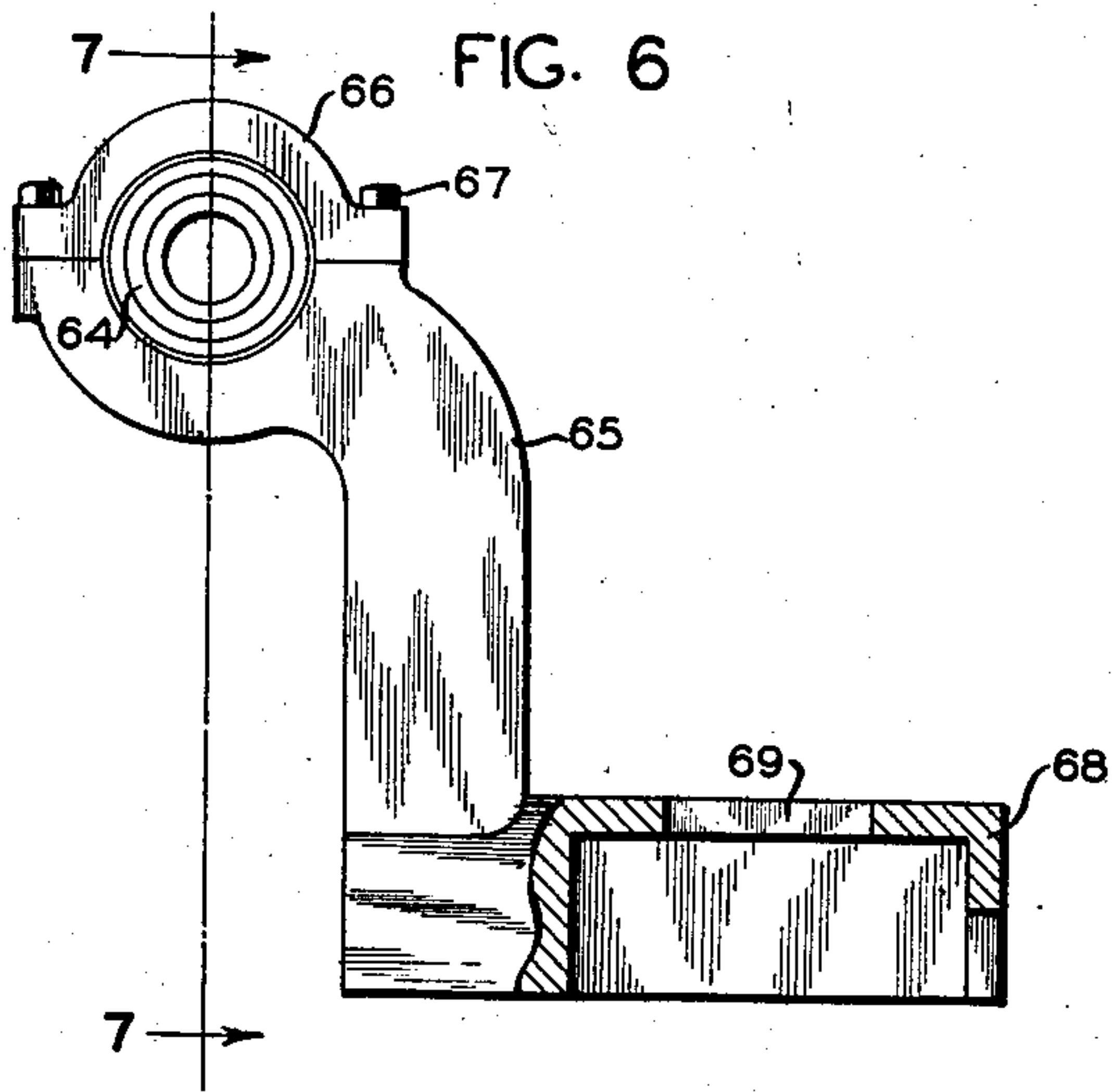
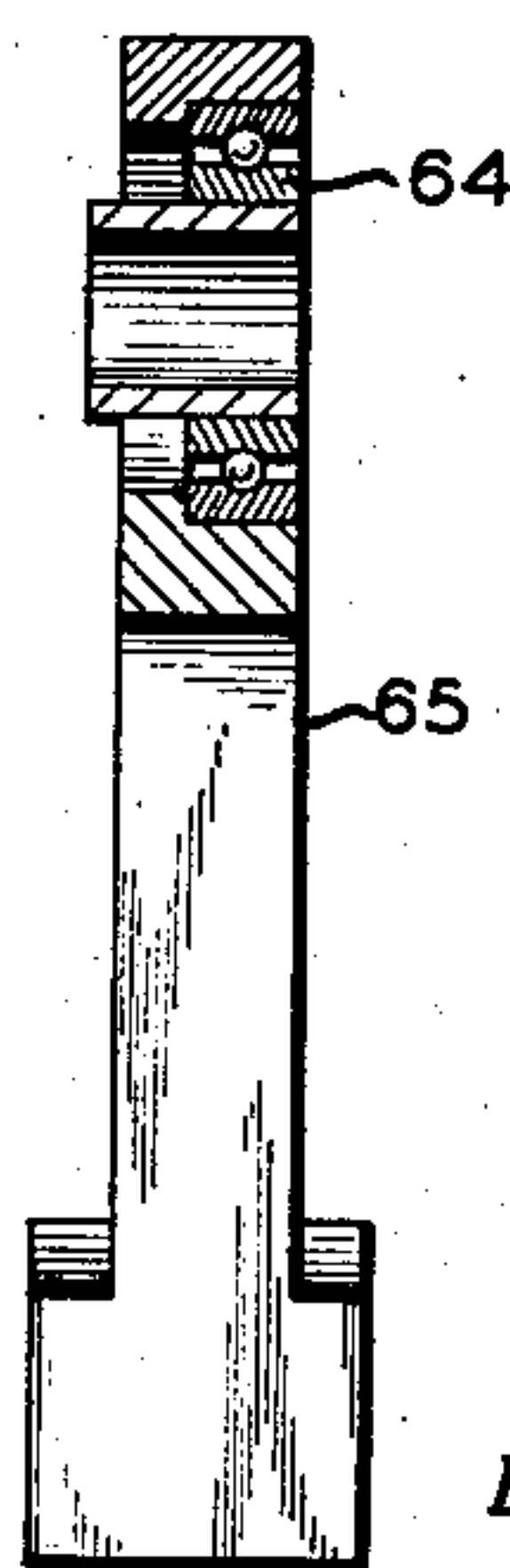


FIG. 7



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COMB BOX MECHANISM

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1 Claim. (Cl. 19—106)

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This invention relates to the production of yarn and cloth, and more particularly to carding mechanism, wherein fiber is removed by combs from carding cylinders. Prior structures have not been satisfactory because of their expensive upkeep, their excessive use and waste of oil, and their generation of static electricity, by means of which the lint was retained on the surface of the card.

Further the mechanism was short-lived, produced excessive vibration, generated heat, produced noise, and was subjected to excessive wear. Also, due to the excessive heat conducted to the comb, there was frequent breakage.

It is, therefore, an object of the invention to provide an improved comb-operating mechanism or comb box, capable of being easily applied to existing structures, which will provide effective and satisfactory lubrication of the parts, minimize friction and the generation of static electricity, require attention only once or twice a year, which will operate with minimum noise, without wasting lubricant, with upkeep reduced to a minimum, and in which the operation of the comb is more satisfactory and effective.

A further object of the invention is to provide a sealed comb box from which lint and dust are excluded, which also can be installed with unskilled labor and in a minimum of time, and in which certain of the parts can be reversed for changing the comb box from a right to a left-hand drive.

It is a further object of the invention to provide a comb box of rugged construction in which antifriction bearings are used to the fullest extent and in which sufficient lubricant may be retained to preclude the necessity for service over long periods of time.

Further objects and advantages of the invention will be apparent from the following description taken in conjunction with the accompanying drawings, wherein:

Fig. 1 is a side elevation illustrating one application of the invention;

Fig. 2, a top plan view of the mechanism shown in Fig. 1;

Fig. 3, a detailed section on the line 3—3 of Fig. 2;

Fig. 4, a vertical section on the line 4—4 of Fig. 3;

Fig. 5, a detailed section on the line 5—5 of Fig. 3;

Fig. 6, a side elevation of a rock shaft supporting arm or bracket; and,

Fig. 7, a section on the line 7—7 of Fig. 6.

With continued reference to the drawing there

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is shown in Fig. 1 a carding cylinder 10 having a shaft 11 rotatably mounted in bearings 12. The surface of the cylinder 10 is covered with cards 13 having teeth 14 mounted thereon which serve to card the material being fed thereto. The material advances around the surface of the carding cylinder 10 in the form of a web 15 which must be removed from the teeth 14 for further operations thereon.

The web of the material 15 is commonly removed from the teeth 14 of the cards 13 by a doffer comb 16 mounted for oscillatory movement adjacent the surface of the card and serving to remove the material 15 in a continuous web which may be received between feed rolls 17 for feeding to a subsequent operation.

In order to oscillate and support the doffer comb 16 there is provided a comb box 18 having a base 19 secured to the bed of the carding machine. Comb box 18 which is composed of a bottom 20 and upstanding side walls 21 and 22 is secured to a base 19 by bolts or cap screws 23 extending through the base and threaded into the bottom 20. Base 19 is provided with an extension 24 having a slot 25 in the upper surface thereof for reception of a securing bolt 26. This bolt passes through the bed 27 of the carding machine and serves to secure the comb box in position thereon. Additional securing means in the form of a bolt may be utilized if desired and this bolt would pass through the base 27 of the carding machine and a slot 28 provided in the bottom 20 of the comb box.

Wall 22 of the comb box 18 is provided adjacent the lower edge thereof with a box 29 having a bore 30 therein serving to receive spaced antifriction bearings 31. Mounted in these bearings is a drive shaft 32 provided with a drive pulley 33 mounted on the outer end thereof by means of a set screw 34 and key 35 disposed in keyway 36 in the shaft 32. The inner end of shaft 32 is provided with a crank pin 37 which operates in a manner to be presently described.

Adjacent the upper edges of side walls 21 and 22 there is provided apertures 38 and 39 in which are disposed antifriction bearings 40 and 41. Mounted in these bearings is a sleeve 42. A rocker arm 43 is fixed to the sleeve 42 by one or more set screws 44 engaging a woodruff key 45 disposed in a keyway in the sleeve 42. The rocker arm 43 is also provided with a laterally extending pin 46.

A connecting link 47 shown in detail in Fig. 5 is provided with recesses 48 and 49 in which are disposed anti-friction bearings 50 and 51. In order to properly lubricate bearings 50 and

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51 a lubrication fitting 52 is disposed at one end of the link and communicates with a bore 53 extending lengthwise of the link and communicating with recesses 48 and 49 to conduct lubricant from the fitting 52 to the bearings 50 and 51. Bearing 50 in link 47 is mounted on pin 46 extending from rocker arm 43 and bearing 51 is mounted on crank pin 37 extending from the inner end of shaft 32 and it will therefore be seen that upon rotation of shaft 32 an oscillatory movement will be imparted to sleeve 42. A lubrication fitting 54 may be mounted in the box 29 for conveniently supplying lubricant to the bearings 31 in which drive shaft 32 is mounted.

Comb box 18 is positioned on the carding machine as shown in Figs. 1 and 2 and serves to support one end of a rock shaft 55 on which doffer comb 16 is mounted by radially extending arms 57. Rock shaft 55 is provided at one end thereof with a reduced portion 58 of a diameter to be slidably but snugly received within the sleeve 42. In order to lock the reduced portion 58 against movement relative to sleeve 42 the latter is provided with an internal annular recess 59 in which is disposed a split ring 60. Received about the sleeve 42 is a collar 61 which threadedly receives one or more set screws 62 extending through the sleeve 42 and engaging the outer surface of split ring 60. Movement of set screw 62 inwardly clamps the split ring 60 tightly against the surface of reduced portion 58 and firmly locks the same in position against movement relative to sleeve 42. Collar 61 serves to provide a sufficient length of thread to receive the set screw 62 in order to prevent stripping thereof in the event excessive pressure is exerted in tightening the same.

The opposite end of rock shaft 55 is provided with a reduced portion 63 which is adapted to be mounted in an antifriction bearing 64 mounted in a tail stock or bracket 65 by a bearing cap 66 secured in place by screw threaded fastening means 67 or the like. Tail stock 65 is provided with a base 68 having a slot 69 in the upper surface thereof for reception of fastening means to secure the same to the base of the carding machine.

The carding cylinder 10 is driven by a belt 70 engaging a pulley 71 mounted on a drive shaft 72 which in turn is connected by suitable means to cylinder shaft 11. Also mounted on drive shaft 72 is a pulley 73 engaging a belt 74 trained over pulley 33 mounted on the drive shaft 32 of the comb box 18. Rotation of the drive shaft 32 through the action of belt 74 will serve to impart an oscillatory movement to the rock shaft 55 and consequently to the doffer comb 16. The two extremes of movement of the comb 16 are shown in full lines and in phantom in Fig. 1 and this movement tends to strip the web of material 15 from the teeth of the cards and permits feeding thereof by the feed roll 17 to a subsequent operation.

Since carding machines may be provided with either right or left hand drives it is essential in the interest of economy and convenience that the comb box be easily adapted to either type of machine and such requirement is solved by this invention in a very simple yet efficient manner. In order to adapt the comb box for mounting at the opposite end of the carding machine from that shown in Figs. 1 and 2, it is only necessary to remove the rock shaft from the bracket 65 and sleeve 42 and to remove fastening screws

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23 and reverse the position of the comb box 18 on the base 19. The base 19 may then be secured in the position normally occupied by the bracket 65 and the bracket 65 disposed at the opposite end of the machine. The rock shaft is then replaced with reduced end 63 engaging the sleeve 42 and with reduced end 58 engaging the bearing 64 in tail stock 65. This simple operation efficiently adapts the comb box of this invention to use on carding machines having either a right or left hand drive.

Since there is considerable lint present around carding machines it is desirable that the comb box mechanism be protected therefrom and for this purpose a tightly fitting cover 75 is provided which may be conveniently formed of transparent material in order to permit observation of the operation of the comb box mechanism. This cover may be secured in place by screw threaded fasteners 76 or the like engaging the frame of the comb box.

During the carding operation considerable static electricity is generated and since this impedes separation of the material from the cards and also introduces other undesirable effects it is necessary that an adequate means be provided for removing such static electricity. The comb box of this invention is formed of static conducting material and provides such a static removing means in that the same is grounded to the frame of the carding mechanism and provides an adequate path to ground for the static through the side walls 21 and 22, bearings 40 and 41, rock shaft 55, arms 57 and doffer comb 16. This path efficiently conducts substantially all static electricity to ground and removes this troublesome problem from the carding operation.

It will be seen from the above description that there has been provided by this invention a very rugged yet relatively simple comb box mechanism in which the problem of proper lubrication, which heretofore has been a very serious one, is adequately taken care of in that bearings 40 and 41 are of the permanently lubricated sealed type and in which bearings 50 and 51 and 31 may be conveniently lubricated by the injection of a proper lubricant through fittings 52 and 54, sufficient lubricant being retained in the bearings to make lubrication necessary only at widely spaced intervals. Also, the comb box of this invention may conveniently be adapted to either right or left hand drives without the necessity of utilizing additional parts and the rock shaft is secured in place without burring thereof in order to facilitate disassembly or replacement thereof. The various moving parts of the comb box are of course properly balanced to reduce vibration thereof to a minimum.

It will be obvious to those skilled in the art that various changes may be made in the invention without departing from the spirit and scope thereof and therefore the invention is not limited by that which is shown in the drawings and described in the specification but only as indicated in the appended claim.

What is claimed is:

A comb box comprising pair of spaced walls, bearings mounted in said walls in axial alignment, a cylindrical sleeve of substantially uniform outside diameter, rotatably mounted in said bearings, the interior bore of said sleeve being of a size to receive the reduced end of the rock shaft of a doffer comb, a rocker arm removably mounted on said sleeve for axial movement relative thereto and having means for fixedly securing

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said rocker arm in position on said sleeve, a link pivotally connected to the free end of said rocker arm, a crank shaft rotatably mounted in one wall of said box and having its crank throw pivotally connected to the other end of said link, 5 said crank producing oscillation of said sleeve upon rotation thereof, said sleeve being provided with a circumferential groove on its inner periphery, a split ring mounted in said groove and being of such dimensions as to permit the 10 reduced end of the rock shaft of the doffer comb to freely slide through the bore of the sleeve, a collar surrounding said sleeve, a set screw threaded in said collar and projecting 15 through said sleeve for pressing said split ring

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against the doffer rock shaft whereby movement of the sleeve is imparted to said doffer rock shaft, said sleeve being adapted to be inserted in position by axial movement through either side wall.

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