Aug. 8, 1944. W. HAMANN ET AL 2,355,217

EDGE SETTING MACHINE

Original Filed Sept. 21, 1940 4 Sheets-Sheet 1

Fig. 1.

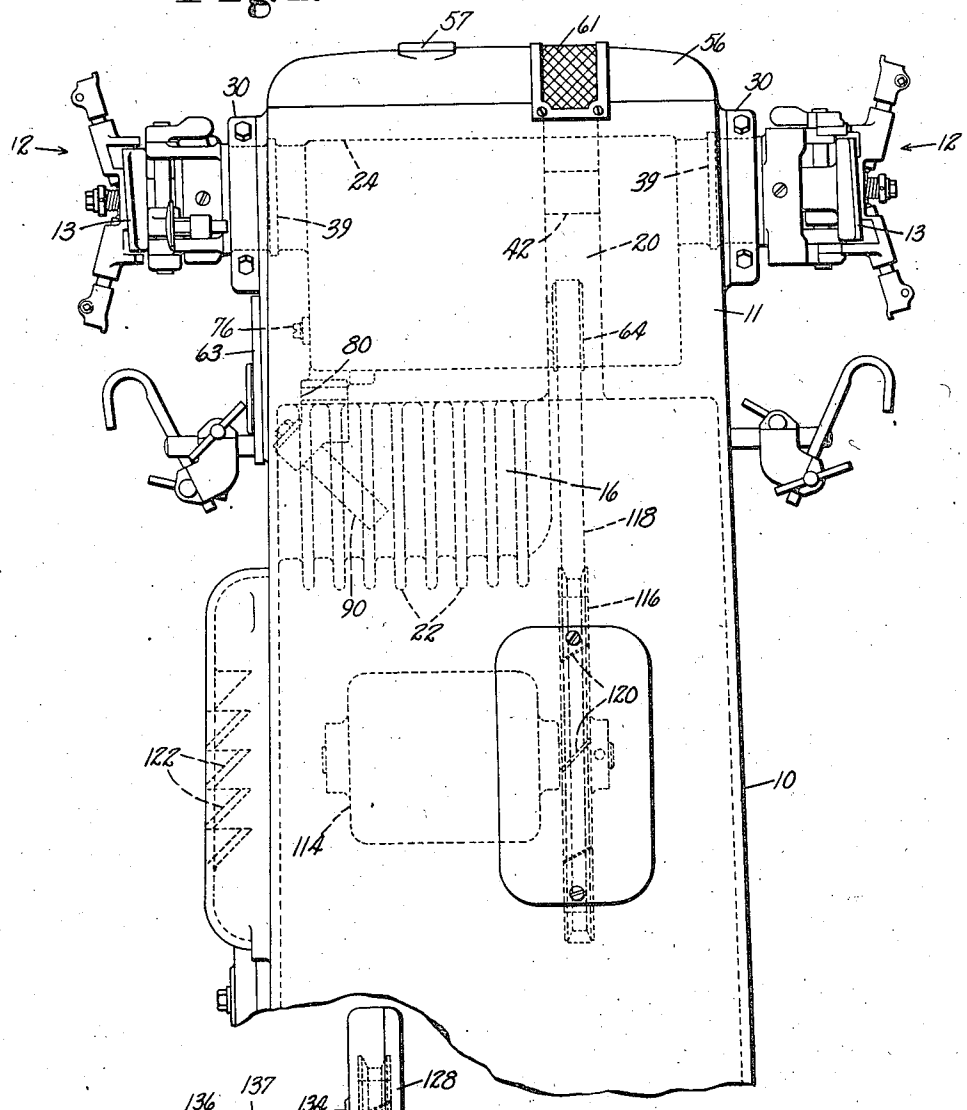
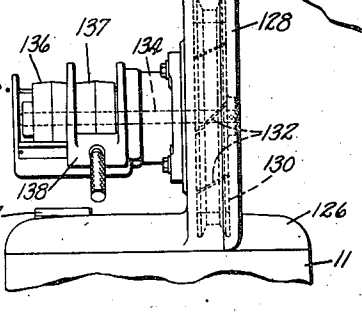


Fig. 2.



INVENTORS
William Hamann
Ralph H. Weller
By their Attorney

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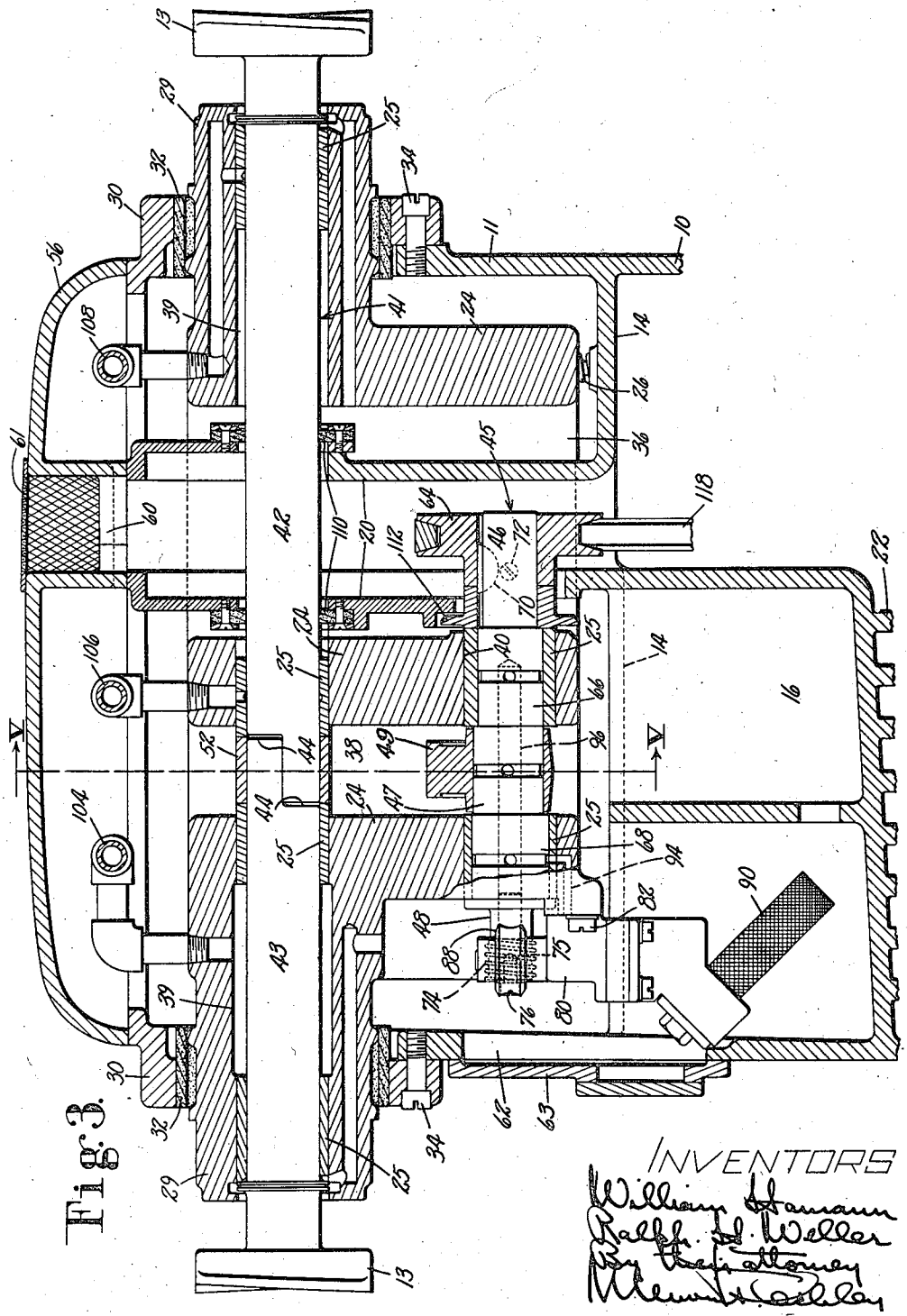


Fig. 3.

INVENTORS
William Hamann
Ralph H. Weller
By their attorney

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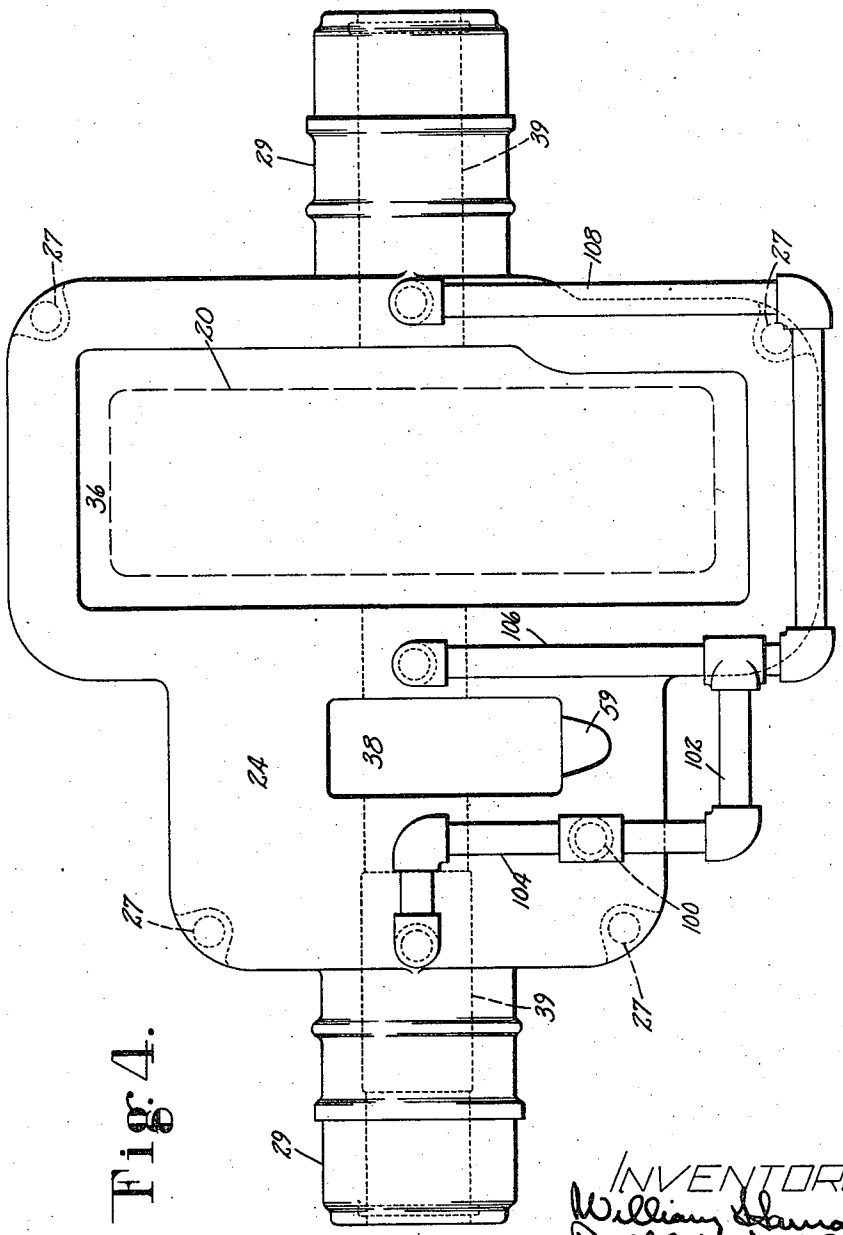


Fig. 4.

INVENTORS
William Hamann
Ralph H. Weller
By their attorney
Clement H. Golden

Aug. 8, 1944. W. HAMANN ET AL 2,355,217

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Fig. 5.

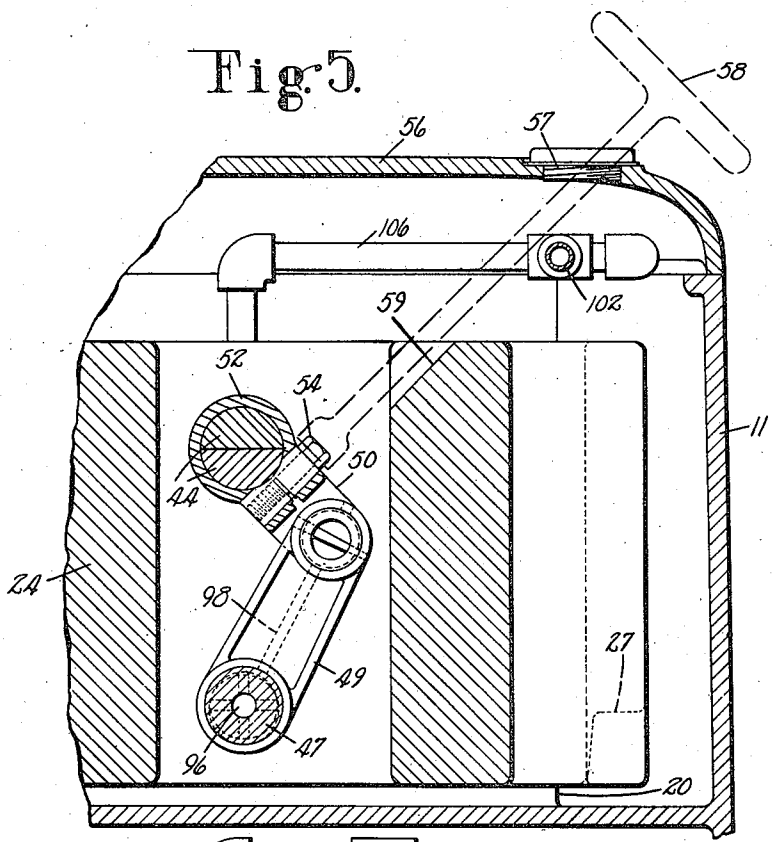
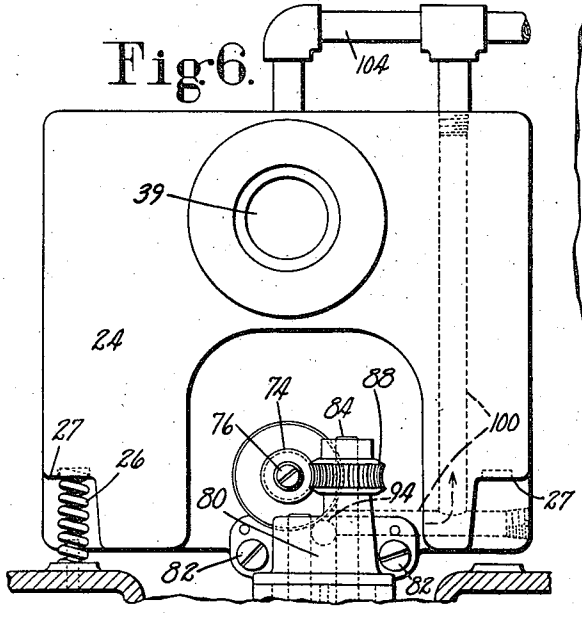


Fig. 6.



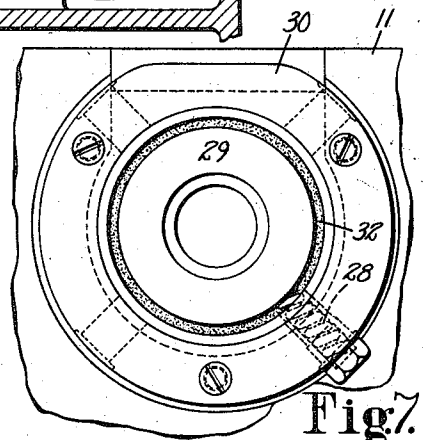


Fig. 7.

INVENTORS

William Hamann

Ralph H. Weller

By their attorney

Merritt Cadwallader

Patented Aug. 8, 1944

2,355,217

UNITED STATES PATENT OFFICE

2,355,217

EDGE SETTING MACHINE

William Hamann, Irondequoit, and Ralph H. Weller, Rochester, N. Y., assignors to United Shoe Machinery Corporation, Flemington, N. J., a corporation of New Jersey

Original application September 21, 1940, Serial No. 357,792. Divided and this application August 14, 1941, Serial No. 406,866

2 Claims. (Cl. 184—104)

This invention relates to machines for operating upon soles and is illustrated as embodied in an edge setting machine such as disclosed in United States Letters Patent No. 2,301,210, granted November 10, 1942, on an application filed in the names of William Hamann and Ralph H. Weller, of which the present application is a division.

The driving mechanism of these machines operates at high speeds, particularly so in some of the more recent machines where speeds of 6,000 tool oscillations per minute are common. In the illustrated machine, the high-speed operating mechanism, which includes a rotatable drive shaft and an oscillatable tool shaft, is mounted in a heavy spring-supported vibration-absorbing block or support which is generally similar to the one disclosed in United States Letters Patent No. 2,190,810, granted February 20, 1940, upon an application filed in the name of L. E. Topham. Obviously, it is highly important that all of the high-speed moving parts be constantly and thoroughly lubricated during the operation of the machine. To that end, the illustrated machine is provided with a force feed lubricating system arranged to force lubricating oil to the bearings of the moving parts of the operating mechanism. The illustrated lubricating system, which includes an oil pump, is mounted on the block so that it moves with the block when the supporting springs yield. This construction permits the use of non-flexing conduits leading from the pump to the bearings so that the oil passages do not kink or bend with the movement of the block relatively to the housing and, as a result, the lubricating system operates with a maximum of efficiency at all times. The oil pump is so located on the block that it can be coupled to and driven by the rotatable drive shaft, thus providing a simple construction with a minimum number of moving parts.

In addition to thoroughly lubricating the moving parts, it has been found that the film of oil maintained in the bearings by the force-feed lubricating system materially reduces the amount of noise made by the machine while in operation.

These machines are frequently placed in a hot, poorly ventilated location in a shoe factory, with the result that difficulty has been experienced from overheated lubricating oil. This difficulty is overcome in the illustrated machine, in accordance with a feature of this invention, by the provision of a blower system which continuously forces air past the oil sump during the operation of the machine. To that end, the housing has been provided with a flue which is so arranged that air can be circulated past the oil sump by blowers which are located either within the housing, as when a self-contained power unit is used, or on top of the housing, as when factory power is utilized to operate the machine.

With the above and other objects in view, the invention will now be described with reference to the accompanying drawings and will be pointed out in the appended claims.

In the drawings,

Fig. 1 is a side elevation of an edge setting machine embodying the features of this invention, the machine being equipped with an electric driving motor;

Fig. 2 is a side elevation of a factory power-driven unit adapted to operate the machine shown in Fig. 1;

Fig. 3 is a longitudinal sectional view on an enlarged scale taken through the head of the machine shown in Fig. 1;

Fig. 4 is a plan view on an enlarged scale of the heavy bearing block which is mounted in the head of the machine shown in Fig. 1;

Fig. 5 is a sectional view taken along line V—V of Fig. 3;

Fig. 6 is an elevation of the left end of the bearing block shown in Fig. 4, the view illustrating the mounting of the oil pump and its connection with the rotatable drive shaft; and

Fig. 7 is a fragmentary end view on an enlarged scale of the head of the machine shown in Fig. 1, the view illustrating the assembled relation of the end of the bearing block with respect to the end wall of the housing.

The illustrated machine embodying our invention is a twin edge-setting machine consisting of a housing which is composed of a column 10 (Fig. 1) adapted to be fastened to the floor by appropriate means and a head 11 which is equipped with similar tool carrier assemblies 12 located on opposite sides. The tool carrier assemblies 12 are similar to those disclosed in United States Letters Patent No. 2,283,204, granted May 19, 1942, on an application filed in the name of William Hamann, each of the assemblies including a shaft head 13 which corresponds to the shaft head 18 in the Hamann application. The interior of the head 11 constitutes an upper compartment which is separated from the interior of the column 10 (constituting a lower compartment) by a horizontal partition 14 (Fig. 3) which is depressed on one side of the machine to form

a sump 16 for the reception of lubricating oil. Formed in the partition on the other side of the machine is a rectilinear flue 20 (Figs. 3 and 4) which extends upwardly through the head 11 and provides a passageway for a current of air, which is circulated by means that will be described further along in this specification. The air passing through the flue 20 is utilized to cool the oil in the sump 16 and, in order to obtain the maximum benefit from this air, the sump is provided with a plurality of cooling fins 22.

Located within the head 11 is a heavy support or bearing block 24 (Figs. 3 and 4) which is supported by and is spaced from the partition 14 by four springs 26 (Fig. 6) that are located at the bottom corners 27 of the block. The block is provided with oppositely located cylindrical portions 29 (Fig. 4) which extend outwardly from the ends thereof and project through the side walls of the head 11. Each of these cylindrical portions is supported by four springs 28 (Fig. 7) which are located 90° apart in filler plates 30 that close the openings in the head through which the cylindrical end portions 29 pass when the block is placed in the machine. The space between cylindrical portions 29 and the filler plates 30 is sealed by packing 32 and the filler plates are fastened to the head by screws 34 (Figs. 3 and 4). Thus, it will be seen that the heavy block 24 is supported by and is spaced from the housing by the springs 26 and 28. The function of the heavy bearing block 24 and springs 26 and 28 is generally the same as that of the similar block and springs disclosed in the before-mentioned United States Letters Patent No. 2,190,810, to L. E. Topham.

The block 24 has formed therein a large rectangular opening 36 (Figs. 3 and 4) that extends heightwise through the block and receives the flue 20 when the block is mounted in the head 11. Also formed in the block a short distance to the left of the large opening 36, as viewed in Fig. 3, is a smaller opening 38 which likewise extends heightwise through the block and which receives part of the tool shaft operating mechanism. The block 24 is provided with two heightwise spaced longitudinal horizontal bores 39 and 40 (Fig. 3), the upper bore 39 extending through the cylindrical portions 29 of the block and the lower bore 40 extending only through the sections of the block on opposite sides of the opening 38. Each of the bores is provided with bearings 25. Mounted in the upper bore 39 is an oscillatable shaft 41 consisting of two sections 42, 43 which are connected respectively at their outer ends to the tool carrier assemblies 12 by the heads 13 and are provided at their adjacent ends with complementally shaped overlapping sections 44. Mounted in the lower bore 40 (Fig. 3) is a rotatable drive shaft 45 consisting of an inner end portion 46 that extends into the flue 20, a relatively small bearing portion 66 located in the block section next to the flue, an eccentric mid-section 47 in the small block opening 38, a relatively large bearing section 68 in the outer bearing block partition and an outer end portion 48 which extends a short distance beyond the end of the block. The eccentric 47 is connected with the oscillatable sections 42, 43 by an eccentric strap 49 (Fig. 5) and a crank 50 which has a split hub 52 that surrounds the overlapping shaft sections 44 and is clamped thereto by a screw 54. Thus, it will be apparent that the crank hub 52 both clamps together the sections of the oscillatable shaft and fastens the crank to the shaft, and thus forms a driving connection between the eccentric 47 and the oscillatable shaft.

The inner end portion 46 of the rotatable drive shaft 45 (Fig. 3) that extends into the flue 20 has mounted thereon a pulley 64 which is held on the shaft by a set screw 72 and is connected to the shaft by a key 70 that has a sliding fit in a keyway formed in the pulley. The other end portion 48 of the rotatable drive shaft has mounted thereon a gear 74, and is provided with a longitudinally extending threaded recess 75, the purpose of which will be explained subsequently, and which is normally plugged by a screw 76.

The high speed moving parts of this machine are at all times thoroughly lubricated by a force-feed lubricating system which will now be described. This system comprises a gear type oil pump 80 (Figs. 3 and 6) which is fastened by screws 82 to the left end of the block 24, as viewed in Fig. 1, and extends down into the sump 16. The pump drive shaft 84 is located at one side of the gear 74 on the end of the rotatable drive shaft 45 (Fig. 6) and is coupled thereto by a gear 88. Upon operation, the pump draws oil from the sump through a strainer 90 and forces it to the different bearings through passages which will now be enumerated. The rotatable drive shaft 45 and the crank mechanism are lubricated by oil which is forced from the pump 80 through a passage 94 (Figs. 3 and 6) in the block to the large bearing portion 68 and to a central passage 96 in the rotatable drive shaft, thence through appropriate openings to the bearings of the eccentric portion 47 and the relatively small bearing portion 66. Oil is also forced from the passage 96 through a central opening 98 in the eccentric strap 49 (Fig. 5) to the joint between the strap and the crank 50. The oscillatable shaft 41 is lubricated by oil forced from the pump 80 through a passage 100 (Fig. 6) to the top of the block, thence through a pipe 102 to pipes 104, 106, and 108 (Fig. 3) which lead the oil to the three bearings for the oscillatable shaft. The lubricating oil escaping from the bearings is kept within the head 11 by the packings 32 (Fig. 3) which surround the cylindrical block portions 29, the packing rings 110 which seal the openings in the flue 20 in which the shaft section 42 is located, and the shield 112 which protects the flue opening in which the section 46 of the rotatable drive shaft is located. From the foregoing description it will be noticed that all parts of this lubricating system are fixedly and non-flexibly connected with the block 24 so that they move with the block relatively to the housing and do not kink or bend, with the result that the oil is circulated at all times with the maximum of efficiency. Also, by using a common drive for the oil pump and the tool shaft, a simple and efficient operating construction is provided which insures effective lubrication of the parts continuously during the operation of the machine.

Provision has been made for the removal of the rotatable drive shaft and either one or both of the sections 42, 43 of the oscillatable shaft from the machine without removing the heavy block from the head. To this end, the housing has been provided with a cover plate 56 which includes an opening 57 that is located at one side of the longitudinal axis of the oscillatable shaft 41 so that when it is desired to remove one or the other of the sections 42, 43, a wrench 58 (Fig. 5) can be inserted through the opening 57 and the screw 54 backed off sufficiently to loosen

the hub 52. The top edge of the block on the right of the crank mechanism, as shown in Fig. 5, is channeled at 59 to provide ample clearance for wrench 58 when it is desired to turn the screw 54. The cover plate 56 is also provided with a rectangular opening 60 (Fig. 3) that is shaped similar to and registers with the top edge of the flue 20, the opening being protected by a wire guard 61.

The rotatable drive shaft 45 can be removed through an enlarged opening 62 (Fig. 3) which is formed in the left side of the housing, as viewed in Fig. 1, opposite to the oil pump 80 and is normally closed by a side plate 63. The strainer 90 can also be removed through this opening when it is desired to clean the same. When it is desired to remove the rotatable drive shaft from the block 24, the oil pump is removed, the set screw 72 (Fig. 3) backed off and then the screw 76 is removed from the end of the shaft. A handled tool having a threaded end portion is next screwed into the recess 75, thereby securing a firm hold on the shaft which can then be pulled from the block. As the bearing section 68, which is the largest section of the shaft, is located nearest the end of the block, the shaft can be withdrawn without difficulty.

The illustrated machine may either be driven by a self-contained power unit or from a factory source of power such as overhead pulleys. The embodiment shown in Fig. 1 is equipped with a self-contained power unit that consists of an electric motor 114 having a pulley 116 which is coupled with the pulley 64 on the rotatable drive shaft by a belt 118. The pulley 116 is equipped with fan blades 120 that draw air in through louvers 122 in the casing opposite to the motor 114 and force the air upwardly past the fins 22 on the sump through the flue 20 and out through the opening 60 in the cover plate 56, thereby cooling the oil in the sump 16.

When the machine is to be driven by a source of factory power, such as an overhead shaft, the belt 118 is disconnected, the cover plate 56 removed, and the cover plate assembly 126 (Fig. 2) is mounted on the top of the housing in its stead. The cover plate assembly 126 includes an enclosed portion 128 that opens onto the flue 20, and in which is mounted a pulley 130 that is provided with fan blades 132. The pulley 130 is connected to a countershaft 134 upon which is mounted a fixed pulley 136, an idler pulley 137 and a belt shifter 138. The pulley 130 is connected with the rotatable drive shaft pulley 64 by a belt which extends down through the flue 20 and around the pulley 64. This connection is made by loosening the hub screw 54 (Fig. 5), pulling the oscillatable shaft section 42 to the right, as viewed in Fig. 3, until it clears the flue 20, whereupon the belt may be passed down through the flue 20, around the pulley 64, and connected to the pulley 130. After this connection has been made, the section 42 is moved back to its assembled position and is coupled with the section 43 by tightening the screw 54. When the pulley 130 is rotated to drive the machine, the blades 132 suck air through openings in the portion 128 and force it down through the flue 20, past the sump 16, and out through the louvers 122, cooling the lubricating oil in the manner just described.

Having described our invention, what we claim as new and desire to secure by Letters Patent of the United States is:

1. An edge setting machine comprising a stationary housing having a partition in its upper portion arranged to form a casing for tool operating mechanism, said partition including an oil well and a vertically extending air passage, a heavy block located within said casing, edge-setting-tool operating mechanism including an oscillatable shaft and a rotatable drive shaft arranged to operate the oscillatable shaft, said shafts being journaled in the heavy block, a force feed lubricating system connected to the heavy block and arranged to lubricate the moving parts of the tool operating mechanism, and driving means for the rotatable shaft, said driving means including a fan arranged to force air past the oil well and through the air passage in the casing.

2. In an edge setting machine, a housing having a partition which divides the housing into an upper compartment and a lower compartment, tool-operating mechanism in the upper compartment, a lubricating system in the upper compartment for said mechanism, said partition being shaped to form an oil well for said lubricating system and also a flue leading from the lower compartment up through the upper compartment, and means for forcing air past the oil well and up through the flue to cool the oil.

WILLIAM HAMANN.
RALPH H. WELLER.