

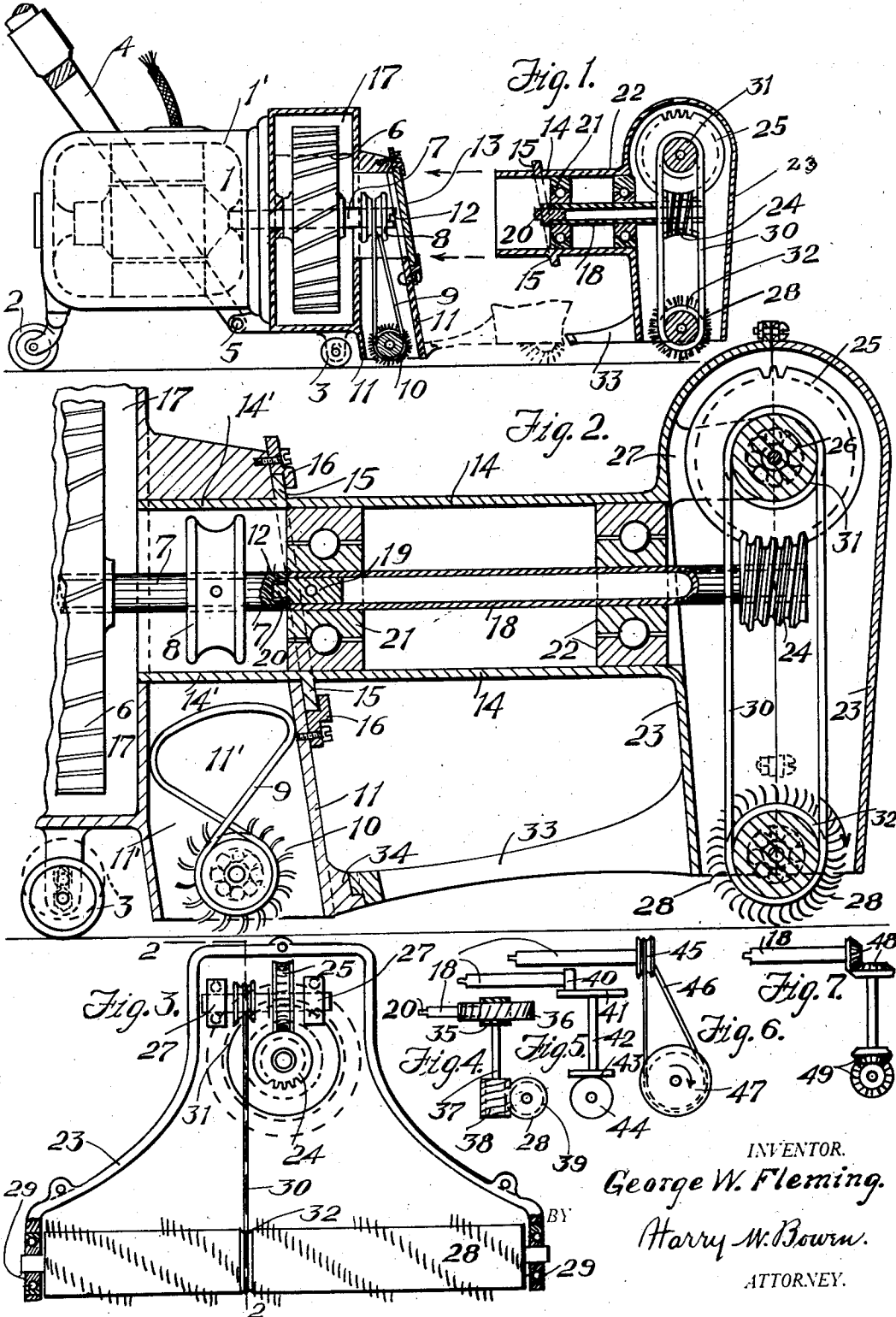
May 1, 1928.

1,667,729

G. W. FLEMING

POLISHING ATTACHMENT FOR VACUUM CLEANERS

Filed Dec. 9, 1925



UNITED STATES PATENT OFFICE.

GEORGE W. FLEMING, OF WORCESTER, MASSACHUSETTS.

POLISHING ATTACHMENT FOR VACUUM CLEANERS.

Application filed December 9, 1925. Serial No. 74,322.

This invention relates to improvements in attachments for vacuum cleaners for the purpose of utilizing the ordinary vacuum cleaner for floor polishing purposes; particularly, for polishing wax floors.

At the present time it is a common practice to use a weight for polishing waxed floors after the wax has been rubbed into the grain of the wood by means of a weighted brush or by hand. The present invention is designed to be used after liquid wax has been spread on the floor with a brush, then moving the vacuum polishing attachment along on the floor for producing a polished surface. The motor of the vacuum cleaner is utilized to operate the polishing member of the attachment.

Broadly it comprises a device which may be readily attached to and removed from the ordinary vacuum cleaner where the usual attachments are applied, as for example, the brushes or other accessories which are attached to a long tube for cleaning furniture, draperies, and the like. The construction and arrangement such that the suction effect is rendered inoperative when the polishing attachment is utilized. The fan shaft is now connected to the shaft which drives the floor polishing member as will be fully described.

The invention, broadly considered, comprises a casing having a rotatable shaft located therein which shaft is driven by the fan-shaft. The polishing member is operated from the main shaft through or by means of suitable operative connections as a worm and gear and belt connection. An important feature of my improvement is that when the floor polishing attachment is connected to the vacuum cleaner the fan member is then operating as an idle member since the air passageway from the floor tool is then cut off by the floor polishing attachment; the construction and arrangement of the attachment when in place being such that its inner end extends across the air passage and effectively closes the same. Since the fan does not now have any work to perform in lifting a column of air substantially, the entire strength of the electric motor is applied to operate and drive the rotatably mounted floor polishing member, as will be fully described. This feature of utilizing substantially all of the power of the vacuum cleaner's electric motor I consider an im-

portant part of my improvement and for which feature I wish to claim the same broadly.

Referring to the drawings:

Fig. 1 is a side elevational view partly in section, through the axis of the shaft of the fan and armature showing the drive shaft of the attachment, the floor polishing element, and the driving connection between the drive shaft, and the polishing element.

Fig. 2 is an enlarged view on the line 2-2 of Fig. 3 illustrating in detail the mounting of the drive shaft which is connected to and operated by the fan shaft, also, the brace support for the outer end of the polishing attachment.

Fig. 3 is a front elevational view of the casing in which the polishing member is rotatably mounted, and the driving connection between the drive shaft and the polishing element, and

Figs. 4, 5, 6, and 7 are modifications of the operative driving connections between the shaft which is operated by the fan shaft and the shaft of the polishing element.

Referring to the drawings in detail:

1 designates the main casing of the usual vacuum cleaner construction in which the motor is placed and is conventionally indicated in dotted lines at 1'; 2 the rear supporting roller for the casing and 3 one of the forward supporting rollers. The handle element is indicated at 4 which is pivoted to the casing at 5. 6 is the fan member of the cleaner which is secured by any suitable means to the main drive shaft 7. Attached to this shaft is a pulley 8 around which passes a belt 9 that operates the usual vacuum cleaner brush 10. The usual floor tool or casing is indicated at 11. The forward end of the shaft 7 is formed with a groove 12. 13 designates the usual plate or cover on the floor casing 11 which plate is for the purpose of closing this casing during the normal operation of the machine when used as a vacuum cleaner. When the plate is removed the usual vacuum cleaner attachments may be secured to the casing 11.

Referring now more in detail to the present invention. 14 designates a tubular member which is formed with a flange part 15, whereby this tubular member may be attached to the casing 11 when the plate 13 is removed. The securing means for retain-

ing the tubular casing 14 in place is indicated at 16 which may comprise latches or other suitable devices. The tubular member 14 is of sufficient length at its inner end portion 14' to extend across the air passage 11' of the floor casing 11 and effectually cut off or close the air passageway from the brush 10 to the fan chamber 17. 18 designates a tubular drive shaft which is located within the tubular casing member 14. Located within the tubular casing 14 and within the inner end of the tubular shaft is a part 19 which is formed with a key or splinelike member 20 which fits into the groove 12 of the main shaft 7. The shaft 18 is mounted on suitable ball-bearing construction 21 and 22. The tubular casing 14 is formed at its outer end with a depending casing or part 23 and in this casing is located the worm 24 that is attached to the shaft 18 and which meshes with the teeth of the worm gear 25 which gear is mounted on the ball bearing shaft construction 26. The shaft is supported on the brackets 27 which are arranged in the upper part of the casing 23. Near the lower edge of the casing 23 is a floor polishing member 28 of suitable construction which is rotatably supported in the ball bearing boxes 29 shown in Fig. 3. The polishing member is driven by means of the belt 30 which passes over the pulley 31 and is located in the groove 32 of the polishing member 28. For the purpose of rigidly supporting the forward end of the depending casing 23, a brace bar 33 is provided which is preferably formed integral with the casing 23. Its lower inner end rests in a socket 34 which is a part of the casing 11. The means for adjusting the vertical position of the polishing member 28 with reference to the floor is the same as that for raising and lowering the brush 10 which is indicated by the dotted lines adjacent the roller 3. The adjusting feature does not form any part of my invention.

Fig. 4 illustrates a modification for driving the polishing member 28 which comprises a worm 35 on the shaft 18, a worm gear 36, a shaft 37, a worm 38 which engages the worm gear 39 on the shaft which carries the polishing element 28.

Fig. 5 shows a further modification in which frictional means is provided for driving the polishing member 28. 40 is a friction disk which engages a second disk 41 that is secured to the shaft 42 and 43 is a disk which frictionally engages a disk 44 on the same shaft on which the polishing member 28 is located.

Fig. 6 shows a further modification for operating the polishing element in which a pulley 45 is employed over which passes a belt 46 that drives a pulley 47, which pulley is secured to the same shaft as the polishing member 28, and

Fig. 7 shows a further modification in which two sets of beveled gears 48 and 49 are employed.

As stated above in connection with the broad idea of my invention, when the tubular casing 14 is secured in place, its inner end 14' completely shuts off, or effectively closes, the air intake passageway 11' of the flow casing, whereby the fan 6 is running idle and not now performing any work, in accordance with this well known principle of mechanics, therefore substantially the full strength of the motor 1' is applied to the floor polishing element 28, thus rendering the polishing attachment very efficient.

What I claim is:

1. In combination with a vacuum cleaner having a main casing a suction floor nozzle and a motor driven fan shaft, a second casing having a tubular part and an integral part at an angle to the tubular part and open at its lower end, said tubular part being attached to the forward portion of the vacuum cleaner, a horizontal shaft journaled in the tubular part, means for operating the last mentioned shaft from said fan shaft, a brush at the open lower end of the integral angle part, means for operating the brush from the horizontal shaft, and a brace member permanently attached to the angle part for detachably engaging the floor nozzle for supporting the second casing on the main casing of the cleaner.

2. In combination with the main casing and suction nozzle of an electric vacuum cleaner having a suction fan, and an armature shaft for operating the fan and which nozzle is formed with an opening, an attachable casing for the purpose described and comprising a tubular part for entering the opening in the nozzle and extending across the nozzle, and into the air intake of the fan chamber, said second named casing having a part fixed at an angle to and extending downwardly from the tubular part and open at its lower end, a shaft in the tubular part and operated from the armature shaft, a brush at the open end of the downwardly extending part of the casing, means for operating the brush from the shaft in the tubular part, a flange on the tubular part and spaced from its inner end, means on the nozzle engaging the flange, whereby when the inner end of the tubular member is inserted in the opening of the nozzle and attached therein, it will cut off the normal suction air intake to the fan, as described.

3. In combination with a vacuum cleaner having a casing and a motor driven shaft, a casing having a tubular part and an integral part at an angle to the tubular part and open at its lower end, a part on the tubular part for securing the same to the vacuum cleaner casing, a shaft permanently located in the tubular part, a polishing brush in the open

end of said integral part, means for operating the brush from the first named shaft and comprising a worm on the second named shaft, a worm gear with which the worm meshes, a shaft for supporting the worm gear, a pulley on the same shaft as the worm gear, driving connection between the pulley and the polishing brush arm supporting means on the vacuum cleaner casing, an arm on the second named casing for engaging the arm supporting means of the first named casing.

4. In combination with the main casing of a vacuum cleaner having a nozzle which is formed with an opening, a second casing, a floor polishing brush which is rotatably supported on the second casing, the second casing comprising a member having a lower open end part, bearings in the open end part, the polishing brush being supported in the bearings, a shaft in the second casing, operative connecting means between the shaft and the polishing brush, and means for attaching the casing member to the opening in the nozzle of the main casing, the second casing member having a part which enters the opening in the nozzle and which cuts off the air intake to the main casing, as described.

5. In combination with the casing of a vacuum cleaner having a suction fan and a shaft for the fan, and a floor nozzle, the passage way of which is in communication with the fan, and a cover plate for normally closing an opening in the casing which leads to the said passage way, of an attachment comprising a casing having a part for entering the opening when the cover plate is removed, and of sufficient length to extend

completely across the nozzle passage way for cutting off the flow of air therethrough and another part with an open lower end, a floor polishing element in the open end, and operative connecting means between the fan shaft and the said polishing element.

6. A device for the purpose described for temporary attachment to a vacuum cleaner having a fan and operating means for said fan a suction nozzle with a normally closed opening, and comprising a part for entering the opening of the suction nozzle and extending across the nozzle for completely cutting off the normal flow of air when inserted in said opening, a floor polishing element on the attachment and interconnected operating means between the fan operating means and the polishing element, and means for securing the attachment to the suction nozzle of the cleaner.

7. In combination, a floor polishing attachment for vacuum cleaners having a suction floor nozzle and an opening in the casing of the vacuum cleaner for attachments, a fan, a shaft for supporting the fan, and extending over the suction nozzle, an attachable casing having two compartments, a shaft permanently located in one compartment and extending therefrom for connection with the fan shaft which is over the suction nozzle, a polishing element in the other compartment, operative connecting means between the shaft in the first compartment and the polishing element, the first compartment having a part for entering the opening in the casing of the vacuum cleaner for completely cutting off the flow of air through the suction nozzle.

GEORGE W. FLEMING.