April 12, 1938. B. C. BECKER 2,114,099

SUCTION CLEANER

Original Filed Feb. 6, 1931

Fig. 3.

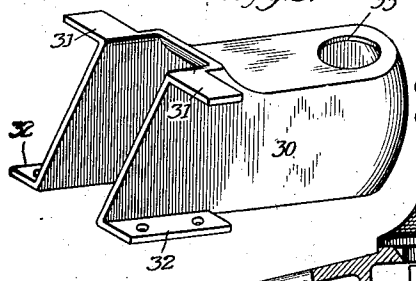
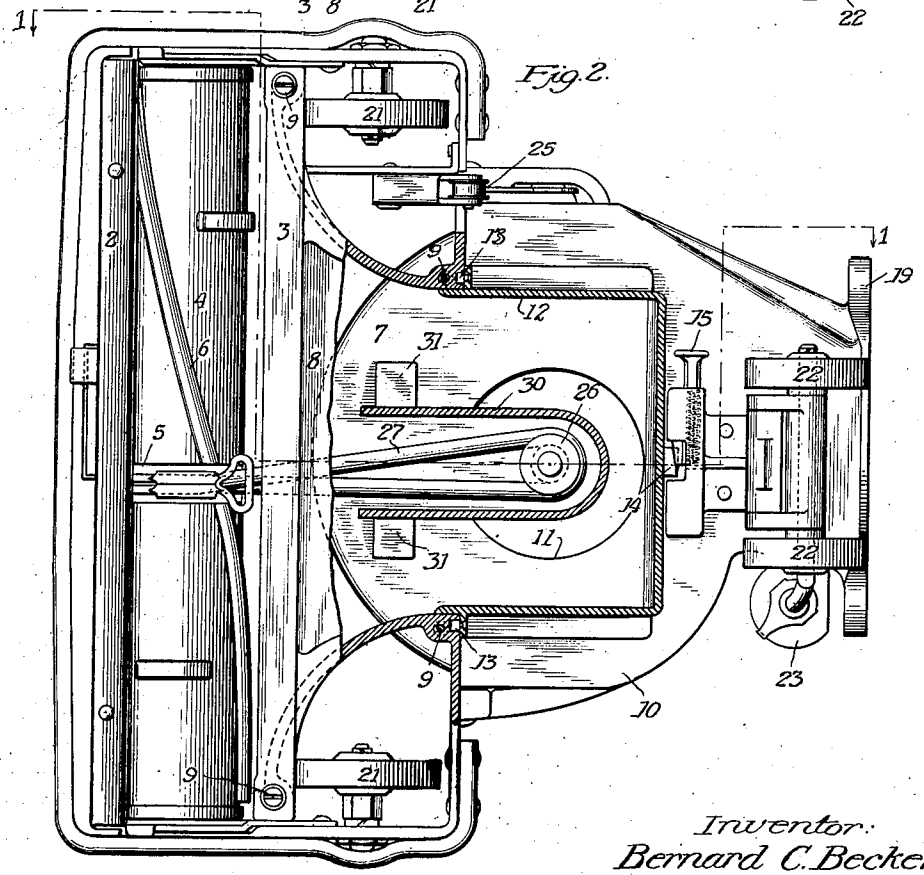


Fig. 1.

Fig. 2.



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2,114,099

SUCTION CLEANER

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3 Claims. (Cl. 15—13)

The present invention relates to suction cleaners in general and particularly to new and novel improvements in suction cleaners in which a power-transmitting belt is connected to a drive shaft in the dirt-laden air stream. More specifically, the invention comprises a new and improved suction cleaner construction in which the junction of the driving shaft and the power-transmitting belt is suitably protected without undue interference with the passage of air into the fan chamber.

The present application is a division of application Serial No. 514,008, filed February 6, 1931, which issued as Patent No. 2,053,316.

It is an object of the invention to provide a new and improved suction cleaner. It is another object of the invention to provide a new and improved suction cleaner incorporating a power-transmitting belt in the dirt-laden air stream. A still further object is the provision of an improved suction cleaner construction in which the junction of the drive shaft and the power-transmitting belt is positioned in a suitable housing to protect it from the dirt-laden air stream. Another object is to provide a new and novel belt housing at the junction of the belt and drive shaft at the eye of the fan chamber. These and other more specific objects will appear upon reading the following specification and claims and upon considering in connection therewith the attached drawing to which they relate.

Referring now to the drawing in which a preferred embodiment of the present invention is disclosed:

Figure 1 is a longitudinal cross-section through a suction cleaner constructed in accordance with the present invention, being a section upon the line 1—1 of Figure 2;

Figure 2 is a bottom view of the figure shown in Figure 1 with certain parts broken away and shown in section to illustrate the invention;

Figure 3 is a view in perspective of the belt housing per se.

Referring again to the drawing a modern suction cleaner is illustrated comprising a nozzle 1, formed with front and rear surface-contacting lips 2 and 3, and housing a rotatable agitator 4 formed centrally with a pulley 5 and provided upon its surface with rigid beater elements 6 and unshown brush elements. Nozzle 1 is connected to the fan chamber 10 by an air passageway 7, the bottom wall 8 of which comprises a removable plate upon which is formed the rear nozzle lip 3 and which is removably secured to the cleaner casing by screws 9, 9 etc., positioned at its four corners. The junction of the air passageway 7 and the fan chamber 10 is at the eye 11 of the chamber and is formed by a removable housing 12, which is secured in place through being provided with forwardly extending pins 13, 13 at its forward open end, and with a rearwardly extending cammed shoulder 14 upon its upper rear face which shoulder is removably secured to the under side of the fan chamber by a manually operable spring-pressed detent 15. Fan chamber 10 houses a suction-creating fan 16 the driving shaft 17 of which extends downwardly through the eye 11 into the air passageway 7 at the housing 12. An exhaust passageway 18 leads from the fan chamber and is provided with a rear face 19 which is adapted to seat removably a dirt-separating member such as a dust bag.

Upon the fan chamber 10 and immediately thereover is positioned an unshown driving motor within a casing 20, the shaft 17 of the motor rotatably carrying the fan 16. The machine is movably supported upon front wheels 21, 21 and upon rear wheels 22, 22, the latter being provided with means, indicated generally by the reference character 23, by which they may be raised or lowered relative to the body of the machine for the purpose of adjusting the nozzle mouth, the plane of which is defined by the lips 2 and 3, relative to a surface covering undergoing cleaning. As in the usual suction cleaner, a pivoted handle 24 is provided, including position-retaining means indicated generally at 25, by which the machine may be propelled manually over a surface covering undergoing cleaning.

Upon the lower end of motor shaft 17 within the air passageway 7 is positioned a driving pulley 26. A power-transmitting belt 27 seats upon pulley 26 and extends through the passageway 7 into the nozzle proper where it seats upon pulley 5 formed upon agitator 4.

Upon the rotation of the driving motor suction is created within the nozzle 1 by the suction-creating fan 16 which draws air therefrom and exhausts it through the air passageway and exhaust outlet 18 into the attached dust bag. This rotation of the motor and of the shaft 17 also results in the rotation of the agitator 4 within the nozzle which contacts the surface covering lifted between the lips 2 and 3 to impart thereto a beating and brushing action which assists the air in removing the imbedded foreign matter in the surface covering undergoing cleaning. This foreign matter passes rearwardly through the air passageway 7 and into the fan chamber by the means of the eye 11. In doing so, however, it

passes the junction of the pulley 26 and belt 27 and that junction, if unprotected, often collects foreign matter. According to the present invention a housing member 30 is provided which incloses the junction of pulley 26 and belt 27 and opens forwardly in the direction of the nozzle so that the belt runs freely therein without interference. Housing 30 extends from the underside of the fan chamber 10, immediately adjacent the forward point of the eye 11, downwardly and rearwardly with its adjacent portion spaced from the plane of the eye 11 by an appreciable distance. Ears 31, 31 on the top of the housing contact the under side of the fan chamber to provide a positive alignment, the housing being rigidly secured, as by riveting, to the removable bottom plate 8 by ears 32, 32 which are riveted or secured to that plate. The underside or bottom of housing 30 is open so that upon the removal of the air passageway member 12 the junction of the pulley 26 and of the belt 27 is exposed to view.

As is clear in the drawing, the side walls of the housing 30 extend closely adjacent the shaft 26, and the height of the housing is a minimum permitted by the height of the top of the pulley above the bottom wall of air passageway 7. The top wall of housing 30 being spaced an appreciable distance below the plane of the fan eye 11 makes possible the entrance of air into the fan eye throughout its entire area without appreciable restriction thereto, thereby increasing the fan efficiency. While the forward end of housing 30 is open to the nozzle no appreciable volume of dirt-laden air passes through the housing as the only escape therefrom into the fan is through the top opening 33 which closely surrounds the motor shaft 17 at its entrance into the housing. As a result, collection of foreign matter upon the pulley 26 is substantially eliminated.

Because of the fact that housing 30 may be attached to cleaners already in use, the attachment requiring only the removal of the detachable bottom plate 8 and the securing of the housing to the plate by the screws or rivets, it is clear that the present invention has provided a means of improving appreciably not only new machines, but machines already in use.

A preferred embodiment of the invention has been illustrated but it is to be understood that the invention is susceptible of other specific embodiments and is limited only as set forth by the following claims.

What is claimed is:

1. In a suction cleaner, a fan chamber, a nozzle, a dirt-laden air passageway extended from said nozzle to the eye of said chamber, a drive shaft extended through said chamber and into said passageway, a fan on said shaft in said chamber, a power transmitting belt connected to said shaft adjacent the eye of said chamber, a belt housing enclosing said belt and shaft at their junction and formed with a belt-receiving opening in said passageway facing toward said nozzle, a wall of said housing contacting the fan chamber forward of the eye therein and sloping outwardly therefrom to be spaced from said eye opposite thereto, said housing extending closely adjacent said belt and shaft and offering a minimum of obstruction to flow of dirt-laden air into said fan chamber.

2. In a suction cleaner of the belt driven agitator type, a fan chamber having an eye, an air passageway extended along said chamber to said eye, a drive shaft extended through said chamber into said passageway, a fan on said shaft in said chamber, a belt extended through said passageway to said shaft, and a belt housing positioned in said passageway and enclosing said belt and shaft at their junction, said housing being formed with a wall facing said eye and with side walls extended in the direction of the belt, said first-mentioned wall sloping outwardly from said fan chamber from a point ahead of said eye and extending adjacent said eye and at a distance therefrom, said side walls extending closely adjacent said belt and with said first-mentioned wall forming in said passageway a belt-receiving opening forward of said eye and facing therefrom.

3. In a suction cleaner of the belt-driven agitator type, a fan chamber having an eye, an air passageway extended along said chamber and having a removable portion at said eye to give access to the interior of said passageway, a drive shaft extended through said chamber into said passageway, a fan on said shaft in said chamber, a belt extended through said passageway to said shaft, and a belt housing positioned in said passageway and enclosing said belt and shaft at their junction, said housing being formed with a wall facing said eye and with side walls extended in the direction of the belt, said first-mentioned wall sloping outwardly from contact with said fan chamber from a point ahead of said eye and extending adjacent said eye and at a distance therefrom, said side walls extending closely adjacent said belt to a point forward of said removable portion and there secured to the wall of said passageway opposite said fan chamber, the side of said housing adjacent said removable portion being open to permit access to the junction of the belt and shaft upon the removal of said portion.

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