Feb. 1, 1944. G. R. SEVERANCE 2,340,347

VACUUM CLEANER

Filed Feb. 6, 1941 3 Sheets-Sheet 1

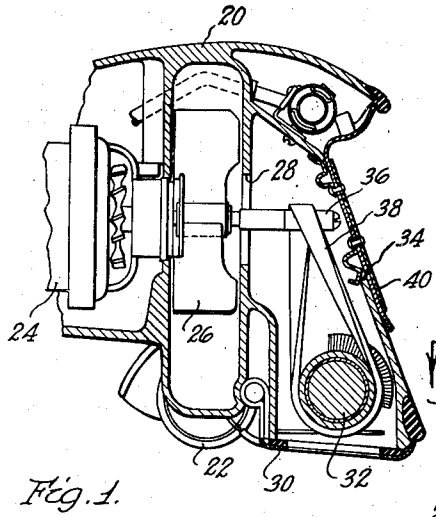

Fig. 1.

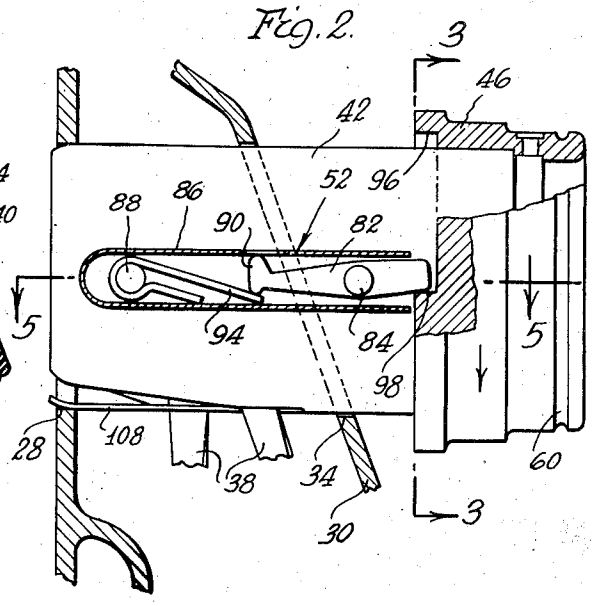

Fig. 2.

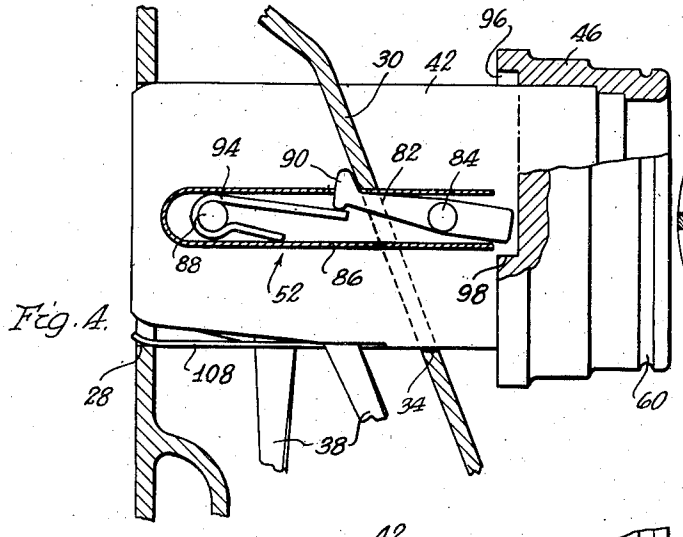

Fig. 4.

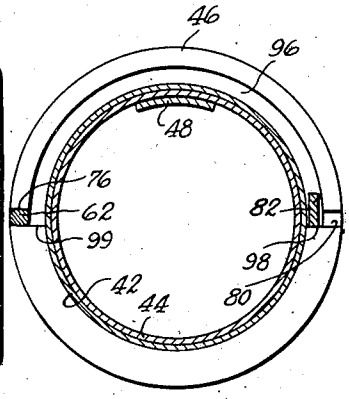

Fig. 3.

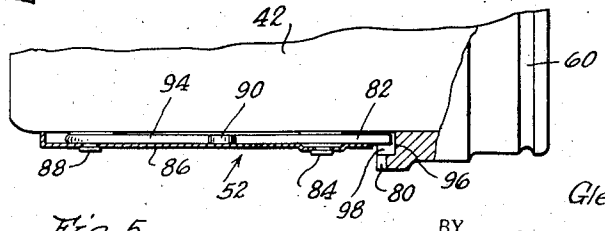

Fig. 5.

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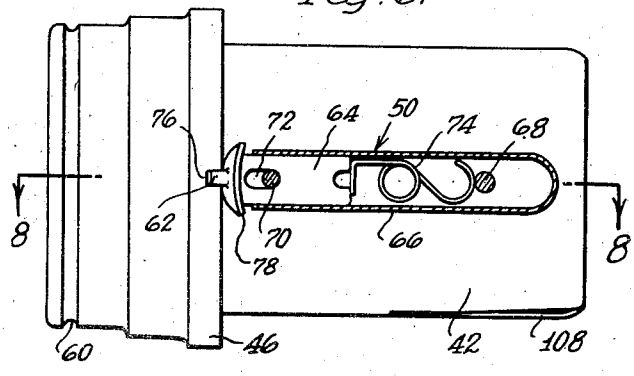
Feb. 1, 1944. G. R. SEVERANCE 2,340,347

VACUUM CLEANER

Filed Feb. 6, 1941 3 Sheets-Sheet 2

Fig. 6.



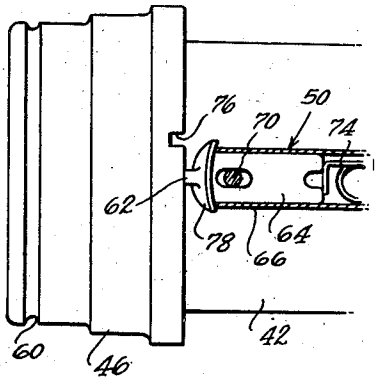


Fig. 7.

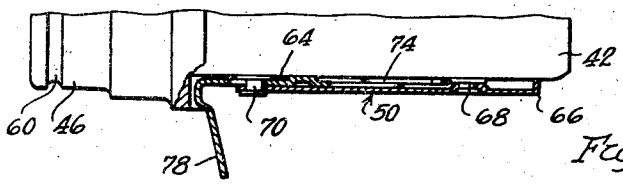


Fig. 8.

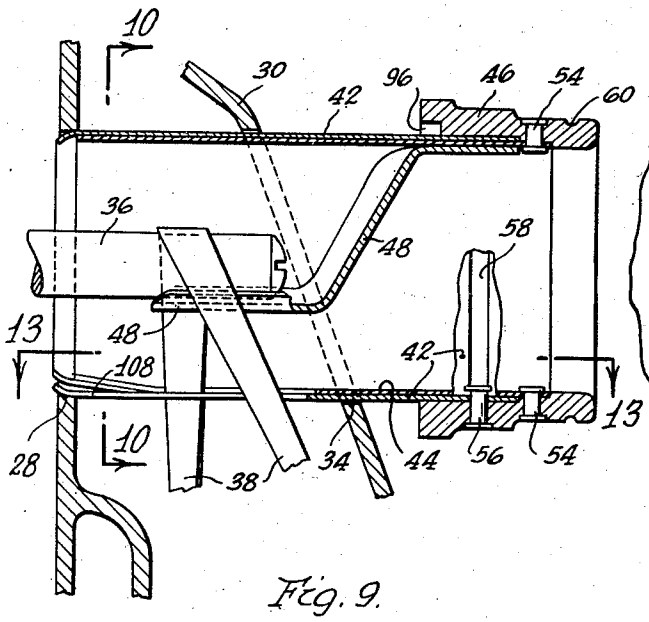


Fig. 9.

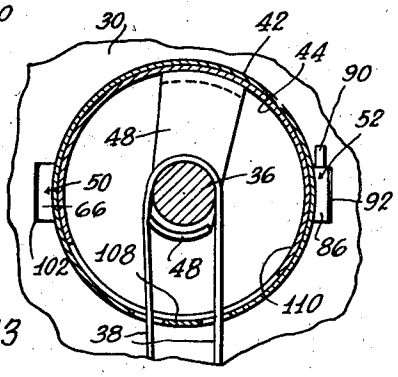


Fig. 10.

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Feb. 1, 1944. G. R. SEVERANCE 2,340,347

VACUUM CLEANER

Filed Feb. 6, 1941 3 Sheets-Sheet 3

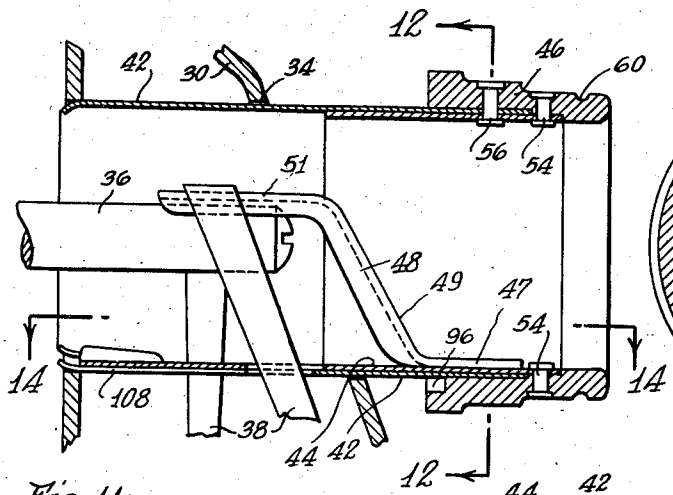

Fig. 11.

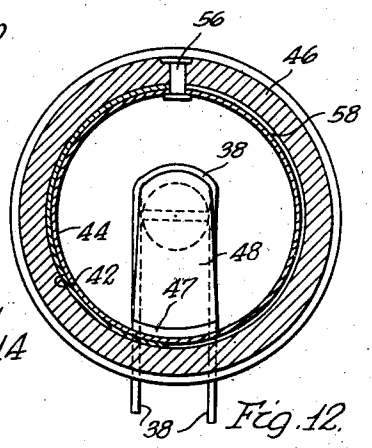

Fig. 12.

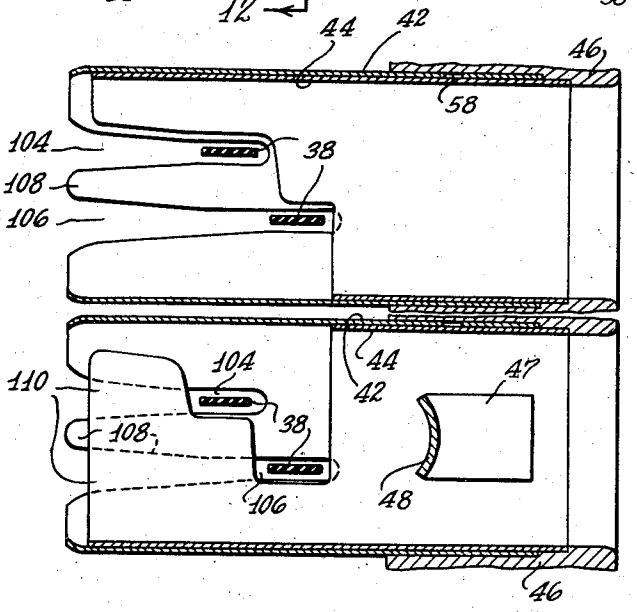

Fig. 13.

Fig. 14.

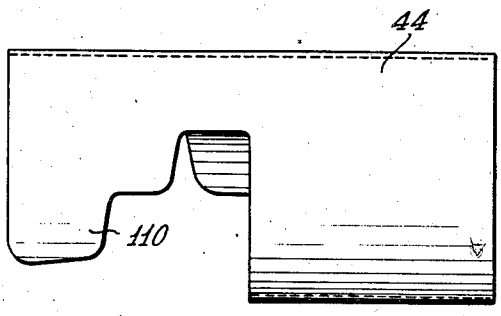

Fig. 15.

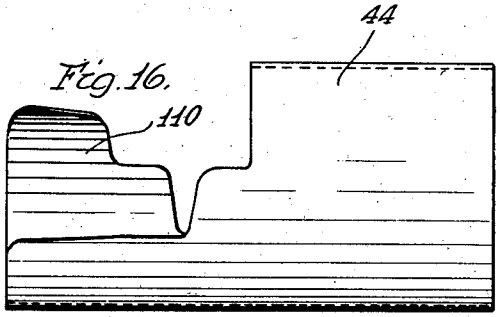

Fig. 16.

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Patented Feb. 1, 1944 2,340,347

UNITED STATES PATENT OFFICE

2,340,347

VACUUM CLEANER

Glen R. Severance, Detroit, Mich., assignor to Eureka Vacuum Cleaner Company, Detroit, Mich., a corporation of Michigan

Application February 6, 1941, Serial No. 377,705

8 Claims. (Cl. 15—9)

This invention relates to converters or couplers in the nature of attachments which are adapted to provide a means by which cleaning tools may be operatively connected to a vacuum cleaner of the type comprising a casing having a floor cleaning nozzle with a surface covering agitator associated therewith.

A principal object of the invention is to provide a converter attachment of the character disclosed herein which is constructed and arranged so that the part of the driving connection between the motor of the cleaner and the agitator thereof within the converter does not form a barrier or trap for dirt, lint or threads.

Another object of the invention is to provide a converter attachment for a vacuum cleaner which is adapted to break the communication between the suction creating means and the floor nozzle of the vacuum cleaner; to break the driving connection between the driving means and the surface covering agitator of the vacuum cleaner, and to provide a coupling by means of which cleaning tools may be readily connected to the suction creating means of the cleaner so as to receive substantially the full suction effect thereof.

Another object of the invention is to provide a converter attachment for a vacuum cleaner which is constructed and arranged so as to be more dependable, efficient and convenient in operation.

Another object of the invention is to provide a novel and improved form of converter in the nature of an attachment for vacuum cleaners.

In the embodiment of the invention selected for purposes of illustration a vacuum cleaner having a motor, suction creating means driven thereby, a port communicating with said suction creating means, a floor nozzle communicating with said suction creating means through said port, a surface cleaning agitator associated with said nozzle and a driving connection between said motor and said agitator for actuating the same is constructed and arranged so as to have associable therewith a converter in the nature of an attachment forming a coupling member having provisions at its outer end for connecting cleaning tools thereto. The converter, in the form illustrated, comprises a hollow cylindrical member having one end thereof formed to seat on the edge of said port and is provided with holding means which are cooperable with a part of the cleaner for detachably holding the converter in operative position with respect to said port, a means cooperative with said driving connection for rendering the same inoperative and operative, a latching mechanism which is adapted to releasably lock the converter in positions where the driving connection and the holding means are operative or inoperative, and a means to deflect lint, threads, etc., from collecting on that part of the driving connection disposed within the converter.

Other objects and advantages of the invention will be apparent from a consideration of the following specification taken in conjunction with the accompanying drawings, of which there are three sheets, and wherein:

Fig. 1 is a vertical longitudinal sectional view through a portion of a suction cleaner with which a device embodying my invention may be associated;

Fig. 2 is a side elevational view with parts broken away and other parts shown in section, illustrating one embodiment of the invention and the manner in which it is adapted to be associated with the suction cleaner illustrated in Fig. 1;

Fig. 3 is a vertical section on the line 3—3 of Fig. 2, looking in the direction of the arrows;

Fig. 4 is a view generally similar to Fig. 2 but illustrating the converter secured or locked to the cleaner;

Fig. 5 is a section through the converter securing means taken along the line 5—5 of Fig. 2, looking in the direction of the arrows;

Fig. 6 is a side elevation of the converter (of the side opposite to that shown in Figs. 2 and 4) with parts broken away and illustrating the latching mechanism with the converter locked in the position with the parts as illustrated in Fig. 2;

Fig. 7 is a fragmentary elevational view with parts broken away and showing the latching mechanism when the converter is in the position illustrated in Fig. 4;

Fig. 8 is a section along the line 8—8 of Fig. 6 looking in the direction of the arrows;

Fig. 9 is a view similar to Fig. 4 with the converter in the position as shown in Fig. 4 but shown in cross-section so as to illustrate the relationship of the belt lifting means of the converter to the belt drive of the cleaner before the same is disconnected;

Fig. 10 is a cross-section taken along the line 10—10 of Fig. 9, looking in the direction of the arrows;

Fig. 11 is a view similar to Fig. 9 but showing the relationship of the parts of the converter to

the cleaner when the belt of the cleaner has been lifted out of driving relationship with the shaft thereof;

Fig. 12 is a cross-section through the converter taken along the line 12—12 of Fig. 11, looking in the direction of the arrows;

Fig. 13 is a horizontal section through the converter taken along the line 13—13 of Fig. 9, looking in the direction of the arrows;

Fig. 14 is a view similar to Fig. 13 but taken along the line 14—14 of Fig. 11 and showing the relationship of the parts of the converter when the belt is out of driving engagement with the shaft;

Fig. 15 is a top plan view of the inner sleeve of the converter when the parts are arranged as illustrated in Fig. 13; and

Fig. 16 is a top plan view of the inner sleeve of the converter when the parts are arranged as illustrated in Fig. 14.

Referring now to Fig. 1, there is illustrated a part of a floor type vacuum cleaner which comprises a body 20 movably supported by wheels 22 and having an electric motor 24, a suction creating means 26 driven thereby, an intake port or fan eye 28 communicating with the suction creating means, a floor nozzle 30 having a surface covering agitator in the form of a rotary brush 32 operatively associated with the mouth of nozzle 30 and rotatably supported therein, a port or aperture 34 in the forward wall of the nozzle 30 and aligned with the port 28, and a driving connection between the motor 24 and the brush 32 comprising a shaft 36 driven by the motor and a belt 38 arranged in driving relationship with a pulley formed on the end of the shaft 36 and with a pulley formed on the rotary brush 32 for rotating the same. The opening 34 is closed by a removable plate or cover 40 when the floor nozzle 30 and agitator 32 are in use and as is well known in the art, operation of the motor 24 will actuate the suction creating means 26 and the surface covering agitator 32 and induce a flow of dust and dirt laden air through the mouth of the nozzle 30, the port 28 and through the suction creating means 26 into a dust collecting receptacle (not shown) associated with the cleaner.

As is best illustrated in Figs. 6 to 10, a converter embodying one form of my invention comprises an outer sleeve 42, an inner sleeve 44, a knob or collar 46 secured to the inner sleeve 44 so as to rotate therewith, a belt lifter or belt lifting finger 48 affixed to the inner sleeve 44, a latch mechanism indicated generally at 50 (Fig. 6), and a securing, clamping or holding means indicated generally at 52 (Fig. 10) for securing or holding the converter in operative relationship with the cleaner.

The knob or collar 46 may be secured to the inner sleeve 44 by means of several pins 54 and 56, the latter of which extends through a 180 degree slot 58 formed in the outer sleeve 42 so as to limit the relative rotation between the inner and outer sleeves to 180 degrees of movement or approximately 177 degrees of rotation in a clockwise direction from the position in which the parts are illustrated in Fig. 10. The knob 46 of the converter may be provided with a groove 60 by means of which one end of a coupling member (not shown) on the end of a flexible hose or cleaning tool (not shown) may be connected to the converter and thereby operatively connected to the cleaner, and more particularly to the suction creating means 26 through the port 23 thereof via the passageway provided by the inside of the sleeves 42 and 44.

The latching mechanism (Figs. 6, 7 and 8) comprises a bolt or dog 62 formed on a bar 64 which is supported for reciprocal movement in a guide formed internally of a hollow key 66. The key 66 is rigidly secured at one side of the outer sleeve 42 by pins 68 and 70 and is arranged parallel to the axis thereof. Pin 70 extends through a slot 72 in the plate 64 and a spring 74 confined between pin 68 and one end of the plate 64 biases bolt 62 into a position to engage a notch 76 formed in the periphery of collar 46 on the inside end thereof. A part of the plate 64 is formed as shown at 78 so as to provide a finger engaging portion against which pressure may be exerted for disengaging the bolt 62 from the notch 76. The collar 46 may also be provided with another notch 80 (Fig. 3) for engagement with the bolt 62 when the collar 46 is rotated 180 degrees from the position in which it is illustrated in Fig. 6. When the latch mechanism is in the position illustrated in Fig. 6 the securing or holding means 52 are in the position illustrated in Fig. 2, said holding means 52 comprising a member 82 pivoted at 84 to the outside of the sleeve 42 and arranged within a chamber formed by a hollow key 86 which is secured by pins 84 and 88 to the outside of the sleeve 42 on the side opposite to that on which the key 66 is secured. The member 82 has a head 90 thereof formed to engage the inside of the front wall of the nozzle 30 (Fig. 4) above a slot 92 (Fig. 10) formed therein on one side of the opening 34. The head 90 of the member 82 is illustrated in Fig. 2 in a released or inoperative position and is adapted to project through an opening formed in the upper wall of the key 86 when it moves to the position in which it is shown in Fig. 4. A spring 94 arranged as illustrated biases the member 82 to the position in which it is illustrated in Fig. 4.

As shown in Figs. 2, 3, 4 and 5, the collar 46 is formed internally and in one end thereof to provide a groove 96 extending through slightly more than 180 degrees. The end wall 98 of the groove is adapted to bear against the end of the member 82 when the parts are arranged as illustrated in Fig. 2 for holding the head 90 of the securing or holding means in an inoperative position and the collar 46 is held from turning under the tension of the spring 94 by the dog 62 which is engaged in the notch 76 as illustrated in Fig. 6. Release of the dog 62 from the notch 76 in the manner heretofore explained will permit rotation of the collar 46 with respect to the sleeve 42 and will release the end of the member 82 so as to permit the head 90 thereof to move from the position in which it is shown in Fig. 2 to the position in which it is shown in Fig. 4.

The end wall 98 of the groove 96 is adapted to bear against the end of member 82 when the sleeve 44 and the parts which rotate therewith are arranged in a position 180 degrees removed from that in which they are shown in Figs. 2 and 3 for holding the head 90 of the securing or holding means in an operative position and such parts are held against accidental rotation by the dog 62 which at such time is engaged in the notch 80.

The key 86 as previously indicated is arranged on one side of the outer sleeve 42 parallel with the axis thereof and the key 66 is arranged on the opposite side of the outer sleeve 42 and paral-

lel to the axis thereof. The key 66 is adapted to project into a slot 102 similar to the slot 92 but arranged in the front wall of the nozzle 30 on the opposite side of the aperture 34. The keys 66 and 92 secured to the outside of the outer sleeve 42 provide a means for guiding the outer sleeve when it is inserted into the opening 34 to the port 28 and prevents relative rotation between the converter unit and the cleaner casing.

The outside circumference of the sleeve 42 is just slightly less than the inside projected circumference of the opening 34 while the inner end of the sleeve 42 has approximately the same circumference as that of the port 28 so that the end of the sleeve 42 will seat on the port 28 and provide a fairly good fit and seal therebetween. The sleeves are cylindrical in shape and as shown in Fig. 13, the outer sleeve is relieved at its inner end on the bottom side thereof by belt relieving slots 104 and 106 which have a tongue 108 arranged therebetween, the tongue extending between the strands of the belt 38 when the converter is inserted into the opening 34 and seated on the port 28. The inner sleeve 44 is cut away as illustrated in Figs. 13 to 16 so as to not interfere with the belt 38 when the converter, in the position in which the parts are shown in Fig. 13, is inserted into the opening 34 and seated on the port 28. The sleeve 44 is cut away so as to provide a laterally extending portion 110 which is adapted to overlie the slots 104 and 106 when the parts of the converter are moved to the position illustrated in Fig. 14 except for such portions of the slots 104 and 106 through which the belt 38 passes. For the sake of clarity the belt 38 has been shown somewhat smaller than it actually is relative to the converter and in practice the strands of the belt 38 are of such a size as to occupy substantially the entire portions of the slots 104 and 106 not covered by the portion 110 of the inner sleeve 44.

With the parts of the converter unit locked against movement in the position in which they are illustrated in Fig. 2 by the latching mechanism 50 thereof, and after removal of the plate 40, the sleeve 42 of the converter is inserted through the opening 34 in such a manner that the key 66 will extend through the slot 92 and the key 66 will extend through the slot 102. In this position the axis of the sleeves 42 and 44 will coincide with the axis of the shaft 36. The sleeve 42 is inserted as far as it will go or to the position as shown in Fig. 2 wherein the end of the sleeve 42 is seated on the port 28. During insertion the strands of the belt 38 will be accommodated within the slots 104 and 106 as shown in Fig. 13. Thereafter by releasing the latch 50 so as to disengage the dog 62 from the notch 76 it will be possible to rotate the knob 46 and inner sleeve 44 which rotates therewith in the direction indicated by the arrow in Fig. 2.

The first several degrees of rotation of the knob 46 will free the member 82 and permit the head 90 thereof to engage the inside wall of the nozzle 30 above the slot 92 therein (Figs. 4 and 10) thereby clamping the converter to the cleaner. Continued rotation of the knob 46 in the direction indicated by the arrow in Fig. 2 will move the inner sleeve 44 and the knob 46 to the positions illustrated in Figs. 11 and 14. In this position the bolt 62 of the latch mechanism 50 will engage the notch 80 in the collar 46 and hold the same against rotation until released which is accomplished in the manner previously described, that is, by applying pressure on the release 78 against tension of the spring 74. When the parts of the unit are arranged as illustrated in Figs. 11 and 14, the communication between the mouth of the nozzle 30 and the port 28 will be cut off by the sleeves 42 and 44 and the belt 38 will have been lifted out of driving relationship with the end of the shaft 36. The belt lifter 48 assumes the position with respect to the belt 38 and shaft 36 substantially (but not exactly) as shown in Fig. 9 when the converter unit is initially inserted into the opening 34 and seated on the port 28.

In this initially inserted position the horizontally extending portion of finger 48, which is of slightly greater width than the diameter of shaft 36, simply projects between the strands of the belt 38 and does not break the driving relationship between the belt 38 and the shaft 36. When the parts of the converter have been moved from the aforesaid initially inserted position to the position in which the parts are shown in Figs. 4, 9 and 10, the converter unit will be clamped to the cleaner as previously described and the belt lifter 48 will be arranged as shown in Fig. 10 wherein it is engaging one strand of the belt 38 preparatory to disengaging the same from the shaft 36. However when the parts of the converter are moved to the position illustrated in Figs. 11 and 14 the end of the finger 48 will have moved through an arc and will have lifted the belt 38 out of driving relationship with the shaft 36 thereby resulting in breaking the driving connection between the shaft 36 and the agitator 32 and the converter will be locked in such position by dog 62 engaging in notch 80. When the converter unit is in the position illustrated in Fig. 11, by connecting a cleaning tool as previously described through the intermediary of a flexible hose or suction conduit to the outer end of the converter, the entire suction effect of the suction creating means 26 will be communicated through the passageway formed by the converter unit to such cleaning tool.

By releasing dog 62 from notch 80 and reversing the operations just described the driving connection between the shaft 36 and the agitator 32 may be reestablished, the securing means which clamp the converter unit to the cleaner may be released, the parts of the converter unit may be locked in released position by the engaging of the dog 62 in the notch 76 and the converter unit may then be withdrawn from the cleaner leaving the nozzle 30 and the agitator 32 in an operative position after replacement of the cover 40.

Particular attention is directed to the construction and arrangement of the belt lifter 48. Referring to Figs. 11, 12 and 14, it will be observed that the belt lifter 48 may be formed from a stamping and provided with a securing portion 47, with a deflecting portion 49 and with a belt engaging portion 51. The securing portion 47 is shaped to conform to the inner surface of the sleeve 44 and is arranged adjacent the air inlet end of the converter. The portion 47 may be secured, such as by welding, to the inner surface of the sleeve 44 so as to move therewith. The deflecting portion 49 is curved in cross-section as illustrated in Fig. 14 and slopes upwardly and away from the securing portion 47. The portion 49 is of a width throughout the major portion thereof sufficient to shield the shaft 36 and the strands of the belt 38, thereby to deflect lint, dust and threads carried by the air coming into the converter away from the shaft 36 and the belt 38 so as to prevent the collection of such material thereon. The belt engaging portion 51 is

curved to conform to the surface of the shaft 36 and is spaced slightly therefrom. This construction and arrangement of the belt lifter thus serves as a deflector for that part of the driving connection arranged within the converter and occupies but a small part of the effective cross-sectional area of the converter. It will be observed that when the converter is originally inserted in the cleaner as illustrated in Figs. 9 and 10 that the belt lifter 48 does not act as a shield or deflector for the shaft 36 and belt 38 but of course at such time the converter is not in operative position. However, after the converter is secured in operative position as shown in Figs. 11, 12 and 14, the lifter 48 is arranged to function as a deflector for the shaft 36 and belt 38. Preferably the converter is connected to the cleaner and disconnected therefrom when the motor thereof is at rest.

Subject matter disclosed but not claimed herein is claimed in the application of George D. Jaquith et al., Serial No. 357,148, filed September 17, 1940, and the application of Vernon E. Carlson, Serial No. 376,816, filed January 31, 1941, and assigned to the assignee of the instant application.

While the invention has been described with some detail, it is to be understood that the description is for the purpose of illustration only and is not definitive of the limits of the inventive idea. The right is reserved to make such changes in the details of construction and arrangement of parts as will fall within the purview of the attached claims.

I claim:

1. A converter attachment for use with a vacuum cleaner having a driving motor, suction creating means driven thereby and provided with an inlet port, a floor nozzle communicating with said suction creating means through said port and having an agitator operatively associated therewith and a driving connection between said motor and agitator including a shaft projecting through said port and a belt arranged in driving relationship with said shaft, said attachment comprising a sleeve having provision for connecting a suction cleaning tool thereto and adapted to be seated on said port with said shaft and that part of said belt in engagement therewith disposed within said sleeve, a belt lifter movably arranged within said sleeve and adapted when said sleeve is initially connected to said port to project between the strands of said belt on one side of said shaft, said belt lifter being supported so that upon movement relative to said sleeve, said belt lifter will swing in an arc about said shaft and lift said belt out of driving engagement therewith, said belt lifter having a portion thereof disposed on the upstream side of said belt and shaft, which is arranged, when said belt is out of driving engagement with said shaft, so as to shield said shaft and said belt from foreign matter carried by the air passing through said sleeve when in use.

2. A converter attachment for use with a vacuum cleaner having a driving motor, suction creating means driven thereby and provided with an inlet port, a floor nozzle communicating with said suction creating means through said port and having an agitator operatively associated therewith and a driving connection between said motor and agitator including a shaft projecting through said port and a belt arranged in driving relationship with said shaft, said attachment comprising a sleeve having provision for connecting a suction cleaning tool thereto and adapted to be seated on said port with said shaft and that part of said belt in engagement therewith disposed within said sleeve, a belt lifter movably arranged within said sleeve and adapted when said sleeve is initially connected to said port to project in the direction of air flow through said sleeve and between the strands of said belt on one side of said shaft, said belt lifter being supported so that upon movement relative to said sleeve, said belt lifter will swing in an arc about said shaft and lift said belt out of driving engagement therewith, said belt lifter having a portion thereof arranged on the upstream side of said belt and shaft and arranged, when said belt lifter is holding said belt out of engagement with said shaft, so as to deflect the air passing through said sleeve and foreign matter carried thereby out of engagement with said belt and shaft.

3. A converter attachment for use with a vacuum cleaner having a driving motor, suction creating means driven thereby and provided with an inlet port, a floor nozzle communicating with said suction creating means through said port and having an agitator operatively associated therewith and a driving connection between said motor and agitator including a shaft projecting through said port and a belt arranged in driving relationship with said shaft, said attachment comprising a sleeve having provision for connecting a suction cleaning tool thereto and adapted to be seated on said port with said shaft and that part of said belt in engagement therewith disposed within said sleeve, a belt lifter movably arranged within said sleeve and adapted when said sleeve is initially connected to said port to project between the strands of said belt on one side of said shaft, said belt lifter being supported so that upon movement relative to said sleeve said belt lifter will swing in an arc about said shaft and lift said belt out of driving engagement therewith, said belt lifter having a portion arranged on the upstream side of said belt when said belt is out of engagement with said shaft and so as to extend across that part of said sleeve across which said belt extends.

4. A converter attachment for use with a vacuum cleaner having a driving motor, suction creating means driven thereby and provided with an inlet port, a floor nozzle communicating with said suction creating means through said port and having an agitator operatively associated therewith and a driving connection between said motor and agitator including a shaft projecting through said port and a belt arranged in driving relationship with said shaft, said attachment comprising a sleeve having provision for connecting a suction cleaning tool thereto and adapted to be seated on said port with said shaft and that part of said belt in engagement therewith disposed within said sleeve, a belt lifter movably arranged within said sleeve and adapted when said sleeve is initially connected to said port to project between the strands of said belt on one side of said shaft, said belt lifter being supported so that upon movement relative to said sleeve said belt lifter will swing in an arc about said shaft and lift said belt out of driving engagement therewith, said belt lifter having a portion arranged on the upstream side of and in line with the space between the strands of said belt when said belt is out of engagement with said shaft, so as to prevent foreign matter from collecting on said belt or the end of said shaft.

5. A converter attachment for use with a vac-

uum cleaner having a driving motor, suction creating means driven thereby and provided with an inlet port, a floor nozzle communicating with said suction creating means through said port and having an agitator operatively associated therewith and a driving connection between said motor and agitator including a shaft projecting through said port and a belt arranged in driving relationship with said shaft, said attachment comprising a sleeve having provision for connecting a suction cleaning tool thereto and adapted to be seated on said port with said shaft and that part of said belt in engagement therewith disposed within said sleeve, a belt lifter movably arranged within said sleeve and adapted when said sleeve is initially connected to said port to project between the strands of said belt on one side of said shaft, said belt lifter being supported so that upon movement relative to said sleeve said belt lifter will swing in an arc about said shaft and lift said belt out of driving engagement therewith, said belt lifter having a portion thereof arranged, when said belt lifter is holding said belt out of engagement with said shaft, so as to slope in the direction of air movement through said sleeve from one side thereof toward and across the center and over the end of said shaft.

6. A converter attachment for use with a vacuum cleaner having a driving motor, suction creating means driven thereby and provided with an inlet port, a floor nozzle communicating with said suction creating means through said port and having an agitator operatively associated therewith and a driving connection between said motor and agitator including a shaft projecting through said port and a belt arranged in driving relationship with said shaft, said attachment comprising a sleeve having provision for connecting a suction cleaning tool thereto and adapted to be seated on said port with said shaft and that part of said belt in engagement therewith disposed within said sleeve, a belt lifter movably arranged within said sleeve and adapted when said sleeve is initially connected to said port to project between the strands of said belt on one side of said shaft, said belt lifter being supported so that upon movement relative to said sleeve said belt lifter will swing in an arc about said shaft and lift said belt out of driving engagement therewith, said belt lifter having a belt and shaft shielding portion arranged on the upstream side of and in front of said belt and shaft, when said belt is out of engagement with said shaft, so as to prevent foreign matter from collecting on said belt or the end of said shaft, and means for locking said belt lifter in operative position.

7. A converter attachment for use with a vacuum cleaner having a driving motor, suction creating means driven thereby and provided with an inlet port, a floor nozzle communicating with said suction creating means through said port and having an agitator operatively associated therewith and a driving connection between said motor and agitator including a shaft projecting through said port and a belt arranged in driving relationship with said shaft, said attachment comprising a sleeve having provision for connecting a suction cleaning tool thereto and adapted to be seated on said port with said shaft and that part of said belt in engagement therewith disposed within said sleeve, a belt lifter movably arranged within said sleeve and adapted when said sleeve is initially connected to said port to project between the strands of said belt on one side of said shaft, said belt lifter being supported so that upon movement relative to said sleeve said belt lifter will swing in an arc about said shaft and lift said belt out of driving engagement therewith, said belt lifter having a portion arranged, when said belt is out of engagement with said shaft, so as to extend across that part of said sleeve across which said belt extends and on the upstream side thereof, said portion of said belt lifter presenting a convex surface toward the upstream side of said sleeve.

8. A suction cleaner including a motor having a shaft, a fan driven thereby and having an air inlet port, a floor nozzle, a communication between said nozzle and said port, an agitator operatively associated with said nozzle, a belt in driving relationship with said shaft and agitator for actuating the latter during operation of said fan and extending through said communication, said communication having a normally closed opening through which access to said inlet port may be had, and a removable converter coupling for attaching utility tools to the cleaner, said coupling being adapted to extend through said opening when the same is open and to traverse the path of said belt and to have one end thereof seated within said inlet port, said converter coupling including a belt shifter for lifting the belt out of driving relationship with said shaft, said belt shifter being supported by said coupling so that when the same is connected with said port, said belt shifter can move in a path about said shaft and lift said belt out of driving relation therewith, and means disposed on the upstream side of said belt and shaft when said coupling is connected to said port, and which means are arranged, when said belt is out of driving relation with said shaft, so as to shield said shaft and said belt from foreign matter carried by the air passing through the converter coupling when in use.

GLEN R. SEVERANCE.