

Sept. 29, 1953

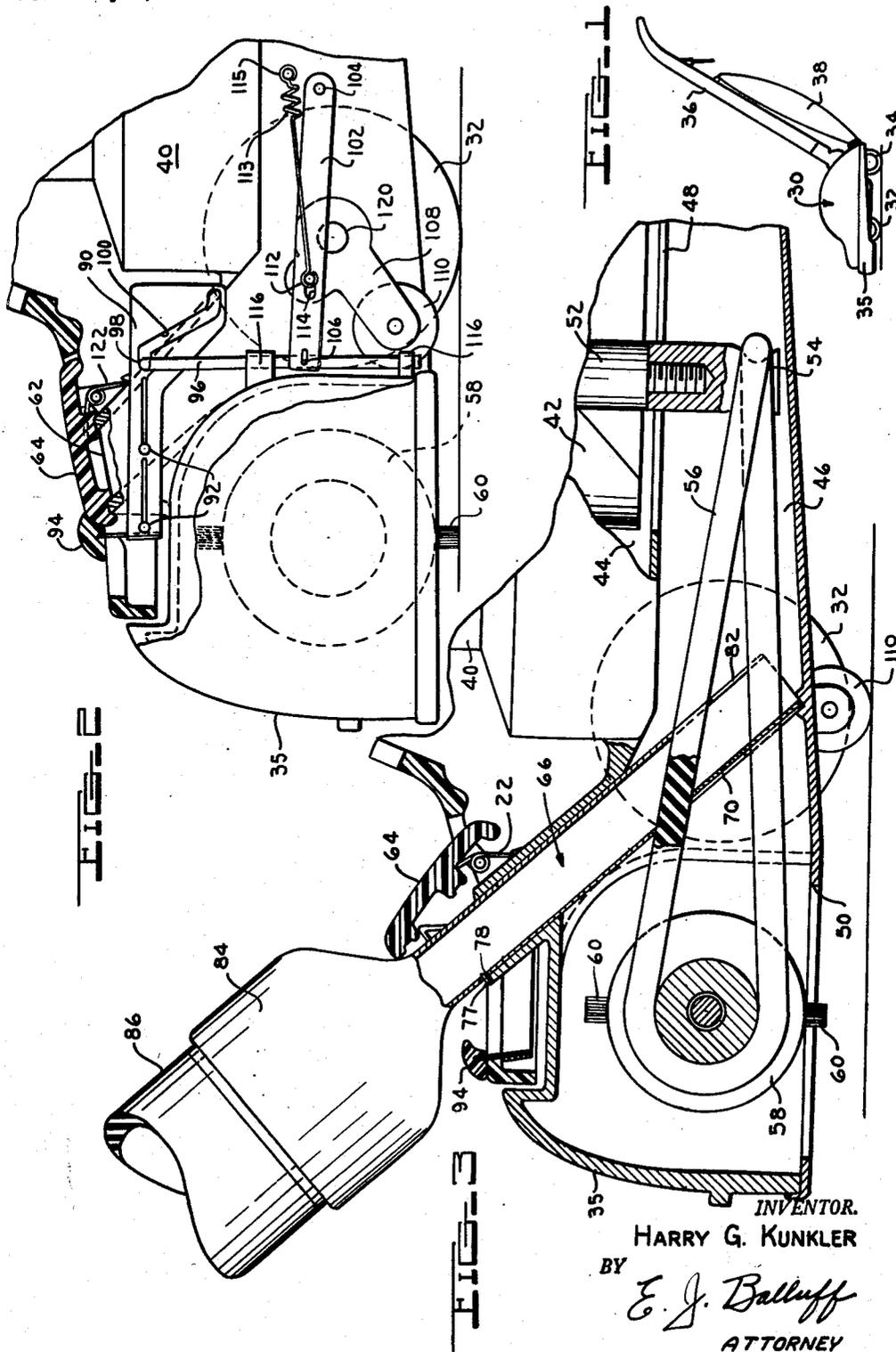
H. G. KUNKLER

2,653,343

SUCTION CLEANER CONVERSION ARRANGEMENT

Filed May 5, 1947

2 Sheets-Sheet 1



INVENTOR.  
HARRY G. KUNKLER  
BY  
*E. J. Balluff*  
ATTORNEY

Sept. 29, 1953

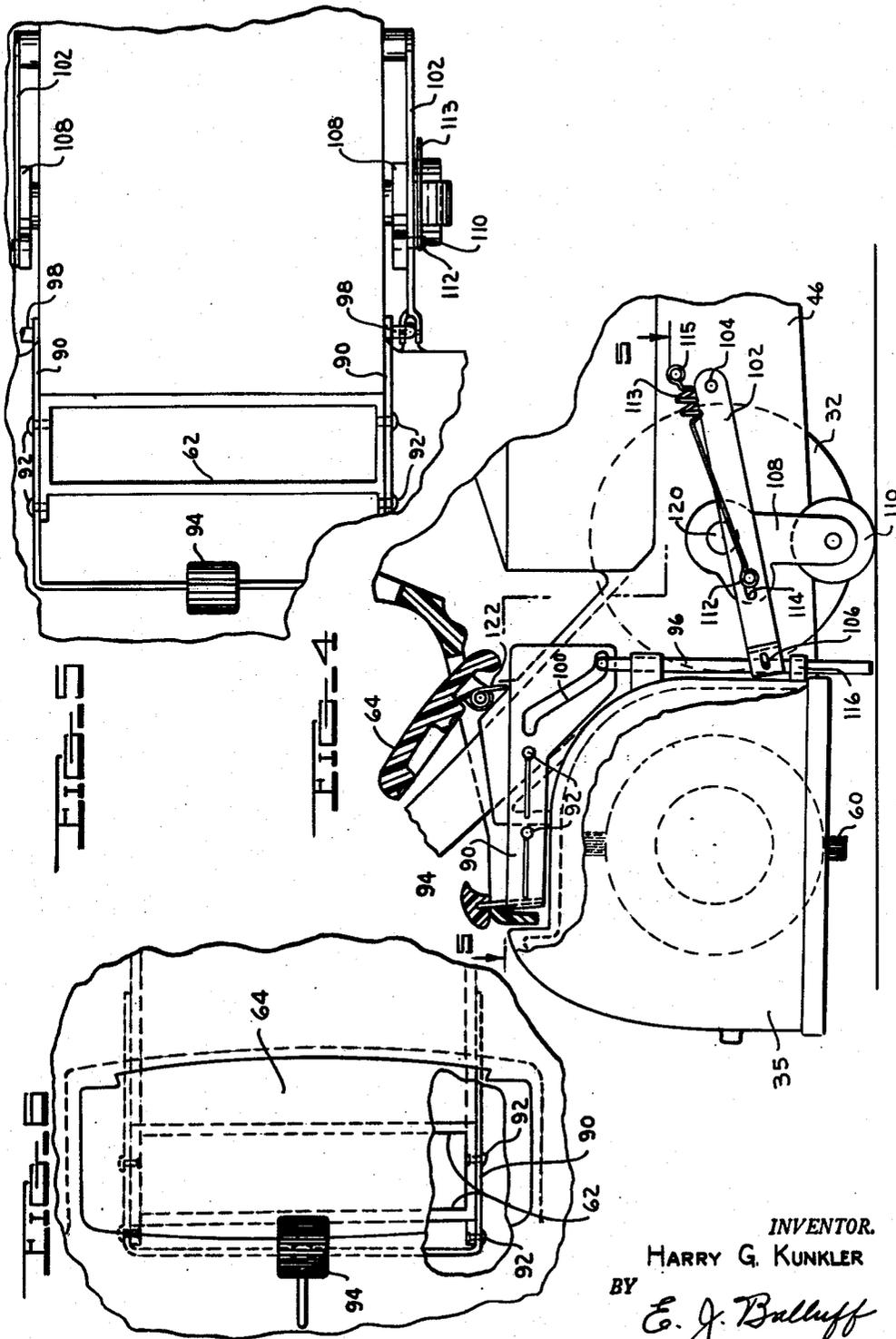
H. G. KUNKLER

2,653,343

SUCTION CLEANER CONVERSION ARRANGEMENT

Filed May 5, 1947

2 Sheets-Sheet 2



INVENTOR.  
HARRY G. KUNKLER  
BY  
*E. J. Balluff*  
ATTORNEY

# UNITED STATES PATENT OFFICE

2,653,343

## SUCTION CLEANER CONVERSION ARRANGEMENT

Harry G. Kunkler, Bloomington, Ill., assignor to  
Eureka Williams Corporation, Detroit, Mich.,  
a corporation of Michigan

Application May 5, 1947, Serial No. 745,935

6 Claims. (Cl. 15-333)

1

This invention relates to suction cleaners and has particular reference to a novel and simple arrangement whereby a floor type cleaner may be converted for off-the-floor cleaning purposes.

A principal object of the invention is to provide a floor type cleaner with a novel and simplified means whereby the cleaner may be converted for off-the-floor cleaning.

Other and further objects of the invention will be apparent from the following description and claims and will be understood by reference to the accompanying drawings, of which there are two sheets, which by way of illustration show a preferred embodiment and the principles thereof and what I now consider to be the best mode in which I have contemplated applying those principles. Other embodiments of the invention embodying the same or equivalent principles may be used and structural changes may be made as desired by those skilled in the art without departing from the present invention and the purview of the appended claims. I also contemplate that of the several different features of my invention, certain ones thereof may be advantageously employed in some applications separate and apart from the remainder of the features.

In the drawings:

Fig. 1 is an elevational view of a cleaner embodying the invention;

Fig. 2 is an enlarged fragmentary sectional view of the cleaner illustrating certain details of the converter arrangement;

Fig. 3 is a fragmentary sectional view through the cleaner showing other details of the conversion arrangement;

Fig. 4 is a fragmentary view somewhat similar to Fig. 2, showing the cleaner arranged for off-the-floor cleaning;

Fig. 5 is a fragmentary sectional view taken along the staggered line 5-5 of Fig. 4; and

Fig. 6 is a fragmentary plan view of the converter port cover in its position as illustrated in Fig. 1, with certain parts broken away.

As illustrated in Fig. 1, a cleaner embodying the invention consists generally of a body indicated generally at 30 having front and rear wheels 32 and 34 supporting the body for movement on a surface covering with the mouth of the nozzle 35 operatively positioned relative to the surface covering. A handle 36 is pivotally related to the cleaner for maneuvering the same, and a bag 38 is provided for collecting the dirt picked up by the cleaner and separating the same from the air which circulates through the cleaner.

The cleaner includes an electric motor 40 which

2

drives a fan 42 arranged in a fan chamber 44. A suction air passageway 46 connects the interior of the nozzle 35 with the fan air inlet 48 so that during operation of the fan air will flow into the mouth 50 of the nozzle through the passageway 46 and into the fan air inlet 48, and the fan 42 will discharge such air into the bag 38, all of which is well known in the art.

The motor includes a shaft 52 which extends through the fan air inlet 48 and has a pulley 54 arranged in the passageway 46. An elastic belt 56 in driving relation with the pulley 54 is arranged in driving relation with an agitator 58 arranged in the nozzle. The agitator comprises a rotary body journaled for rotation inside of the nozzle and having sweeping and/or beating elements 60 arranged to beat and/or sweep the surface covering which is lifted into engagement with the nozzle mouth by the air flowing into the nozzle mouth 50 during operation of the cleaner.

The cleaner is provided with an upwardly facing converter port 62 which communicates with the suction air passageway 46, and a cover 64 pivoted on the cleaner body is arranged for closing or opening the port 62. A tubular air conducting converter element indicated generally at 66 is insertable in the port 62 and is arranged to shut off the communication between the interior of the nozzle and the fan, one wall 70 of the inserted end of the converter element 66 having provisions such as a slot for accommodating the strands of the belt 56.

The inserted end of the converter element 66 is shaped to conform with the cross section of the suction air passageway 46 and to seat therein as shown in Fig. 3.

The wall of the converter element 66 opposite wall 70 thereof is cut away as indicated at 82 so as to establish unrestricted communication between the interior of the converter element 66 and the suction air passageway 46 when the parts are arranged as shown in Fig. 3. The converter element 66 at its outer end is provided with a socket 84 for detachably receiving a coupling on one end of a flexible hose 86, the other end of which is adapted to have various suction cleaning tools connected therewith.

The cleaner is provided with nozzle elevating means for elevating the nozzle 35 and the agitator therein out of working relation with the surface covering when it is desired to use the cleaner for off-the-floor cleaning operations, and such nozzle elevating means consists of a slide bar or rack 90 slidably mounted on pins 92; a converter

port cover locking member 94 carried by the bar 90 at one end thereof, a link 96 having one end 98 thereof working in a cam slot 100 in the bar 90, a lever 102 pivoted at one end 104 thereof to the body of the cleaner and pivotally connected at 106 at the other end thereof to the link 96, and an arm 108 having a floor engaging wheel 110 thereon. A pin 112 carried by the arm 108 projects through a slot 114 provided in the lever 102. The link 96 is arranged for slidable movement in guides 116 provided on the rear wall of the nozzle 35.

The arm 108 is pivoted on shaft 120. An over-center spring 113 connected to the pin 112 and to a pin 115 on the cleaner body is arranged to hold the arm 108 and the wheel 110 in the position shown in Fig. 2 and in the position shown in Fig. 3, and also to expedite the shifting or movement of the wheel 110 from one of its positions to the other. The parts shown in Figs. 2, 3 and 4 are duplicated on the other side of the cleaner.

The arrangement of the foregoing parts of the nozzle elevating means is such that when the converter port cover locking member or button 94 is moved from the position shown in Fig. 2 to that shown in Fig. 4, the wheels 110 will be shifted to the position as shown in Fig. 4 wherein they will project below the lower edge of the wheels 32 and in which projected position they will hold the nozzle 35 and the agitator therein out of working relation with the surface covering.

A torsion spring 122 associated with the pivotal mounting of the converter port cover 64 on the cleaner biases such cover 64 to its open position so that when the button 94 is disengaged from the cover 64 the cover will move to its open position as shown in Fig. 4 so as to permit insertion of the converter 66 into the port 62 as previously described, thereby to complete the conversion of the cleaner for off-the-floor cleaning purposes.

Upon removal of the converter element 66 from the port 62 and closure of the cover 64 and upon locking the cover 64 closed by means of the button 94, the parts will be restored to the position as shown in Fig. 2, in which position the wheels 110 will be shifted to a position above the lower edge of the wheels 32 so that the cleaner may be used for on-the-floor cleaning operations. When the wheels 110 are arranged as illustrated in Fig. 4, the cleaner will be supported at the front by the wheels 110 and at the rear by the wheels 34 so that the cleaner may be pulled forwardly on the floor at such time.

The springs 113 with the parts arranged as illustrated in Fig. 2 hold the wheels 110 in their inoperative or retracted position. As the wheels 110 are shifted toward the position illustrated in Fig. 4, the springs 113 will, when the pin 112 crosses the projection of the line between the centers of the shaft 120 and the pin 115, snap the wheels 110 to the position as shown in Fig. 4. The pins 112 cooperating with the ends of the slots 114 will limit the movement of the wheels 110 in such direction. Similarly, upon restoration of the wheels 110 to their retracted position the springs 113 will expedite such movement, and the pins 112 cooperating with the ends of the slots 114 will form a stop for the retracted position of the wheels.

While I have illustrated and described a preferred embodiment of my invention, it is understood that this is capable of modification, and I therefore do not wish to be limited to the precise details set forth but desire to avail myself

of such changes and alterations as fall within the purview of the following claims.

I claim:

1. A suction cleaner having a body with a nozzle at the forward end thereof, an agitator operatively associated with said nozzle, front and rear wheels supporting said body for movement on a surface covering with said nozzle and agitator operatively positioned relative to said surface covering, a suction creating fan, a motor for driving said fan, a suction air passageway between said fan and nozzle, a belt in said suction air passageway between said motor and agitator to operate the latter, said body having a converter port above said nozzle and connected to said suction air passageway for receiving a converter element to convert the cleaner for off-the-floor cleaning, a cover movably mounted on said body and arranged for closing or opening said port, nozzle elevating means movably mounted on said cleaner body and movable between a retracted position above the lower edge of said front wheels and a projected position below the lower edge of said front wheels, said means upon movement to said projected position elevating said nozzle and agitator to an inoperative position relative to said surface covering, a spring biasing said converter port cover to its open position, a movable locking member engageable with said converter port cover for securing the same in its closed position, means operably connecting said converter port cover locking member to said nozzle elevating means for shifting said nozzle elevating means from either of its said positions to the other upon and by movement of said converter port cover locking member, and an overcenter spring mechanism connected to said nozzle elevating means and operable for positioning said nozzle elevating means in either of its positions and for expediting movement of said means from either of its positions to the other.

2. A suction cleaner having a body with a nozzle at the forward end thereof, an agitator operatively associated with said nozzle, front and rear wheels supporting said body for movement on a surface covering with said nozzle and agitator operatively positioned relative to said surface covering, a suction creating fan, a motor for driving said fan and agitator, a suction air passageway between said fan and nozzle, said body having a converter port above said nozzle and connected to said suction air passageway for receiving a converter element to convert the cleaner for off-the-floor cleaning, a cover movably mounted on said body and arranged for closing or opening said port, nozzle elevating means movably mounted on said cleaner body and movable between a retracted position above the lower edge of said front wheels and a projected position below the lower edge of said front wheels, said means upon movement to said projected position elevating said nozzle and agitator to an inoperative position relative to said surface covering, a manually operable movable locking member engageable with said converter port cover for securing the same in its closed position, and means connecting said nozzle elevating means to said converter port cover locking member for movement therewith for effecting shifting movement of said nozzle elevating means from one of its said positions toward the other position thereof upon movement of said converter port cover locking member into and out of engagement with said converter port cover.

5

3. A suction cleaner according to claim 2 wherein said nozzle elevating means has an overcenter spring mechanism connected thereto, said overcenter spring mechanism being operable for positioning said nozzle elevating means in either of its positions and for expediting the shifting of said means from one of its positions to the other.

4. A suction cleaner having a body with a nozzle at the forward end thereof, an agitator operatively associated with said nozzle, front and rear wheels supporting said body for movement on a surface covering with said nozzle and agitator operatively positioned relative to said surface covering, a suction creating fan, a motor for driving said fan and agitator, a suction air passageway between said fan and nozzle, said body having a converter port above said nozzle and connected to said suction air passageway for receiving a converter element to convert the cleaner for off-the-floor cleaning, a cover movably mounted on said body and arranged for closing or opening said port, nozzle elevating means pivotally mounted on said cleaner body and adapted to be pivoted between a retracted position above the lower edge of said front wheels and a projected position below the lower edge of said front wheels, said means upon movement to said projected position elevating said nozzle and agitator to an inoperative position relative to said surface covering, a movable locking member slidably mounted on said body and detachably engageable with said converter port cover for securing the same in its closed position, and means including a link slidably supported on said body and connected to said converter port cover locking member and to said nozzle elevating means for effecting pivotal movement of said nozzle elevating means from one of said positions to the other upon movement of said converter port cover locking member into and out of engagement with said converter port cover.

5. A suction cleaner having a body with a nozzle at the forward end thereof, an agitator operatively associated with said nozzle, front and rear wheels supporting said body for movement on a surface covering with said nozzle and agitator operatively positioned relative to said surface covering, a suction creating fan, a motor for

6

driving said fan and agitator, a suction air passageway between said fan and nozzle, said body having a converter port connected to said suction air passageway for receiving a converter element to convert the cleaner for off-the-floor cleaning, a cover movably mounted on said body and arranged for closing or opening said port, a wheel carried by an arm pivotally mounted on said cleaner body and movable between a retracted position above the lower edge of said front wheels and a projected position below the lower edge of said front wheels, said wheel forming part of a nozzle elevating means and being operable upon movement to said projected position to elevate said nozzle and agitator to an inoperative position relative to said surface covering, a movable locking member engageable with said converter port cover for securing the same in its closed position, and a connection between said converter port cover locking member and said nozzle elevating means for shifting said nozzle elevating means to said projected position upon and by disengagement of said converter port cover locking member from said converter port cover, said connection including a slide bar having a cam surface thereon and a link connected to said arm and having a portion arranged to be engaged and moved by said cam surface upon movement of said slide bar.

6. A suction cleaner according to claim 5 wherein an overcenter spring mechanism is connected to said arm and is operable for positioning said wheel in either of its positions.

HARRY G. KUNKLER.

References Cited in the file of this patent  
UNITED STATES PATENTS

Number	Name	Date
1,980,205	Isola	Nov. 13, 1934
2,174,595	Pierce	Oct. 3, 1939
2,416,786	White	Mar. 4, 1947
2,517,670	Humphrey	Aug. 8, 1950

## FOREIGN PATENTS

Number	Country	Date
284,650	Germany	June 2, 1915
326,421	Great Britain	Mar. 13, 1930