

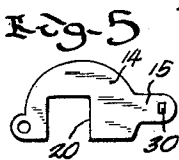
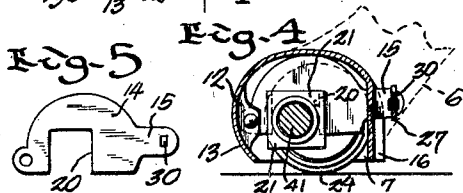
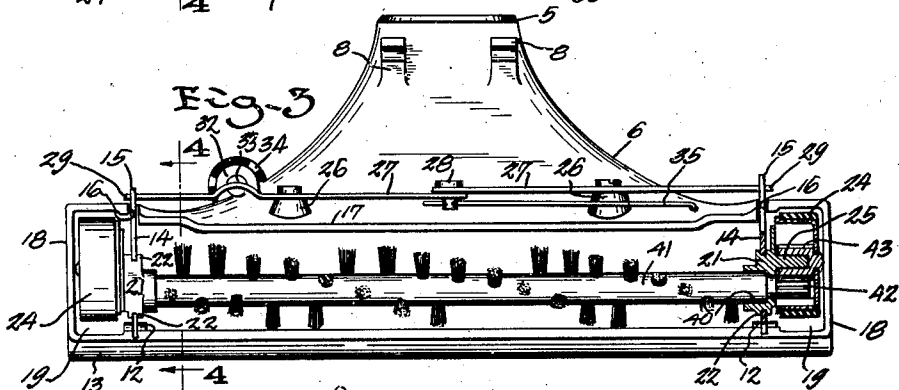
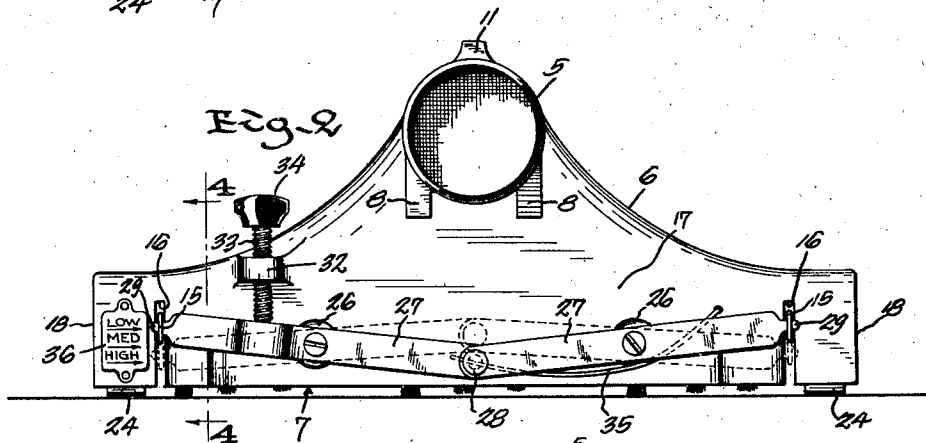
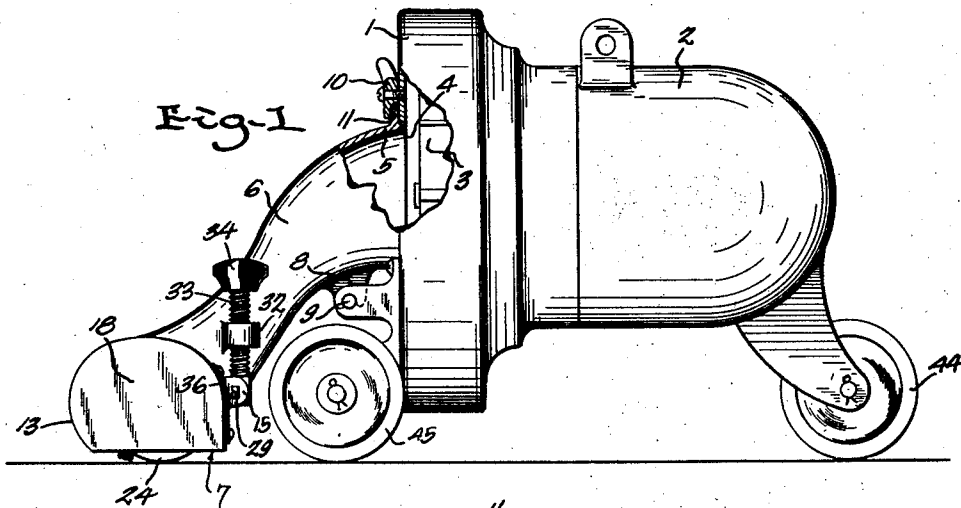
Oct. 16, 1934.

J. B. KIRBY

1,976,998

SUCTION CLEANER

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UNITED STATES PATENT OFFICE

1,976,998

SUCTION CLEANER

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Application February 3, 1931, Serial No. 513,131

11 Claims. (Cl. 15—8)

This invention relates to suction cleaners and has for its object the provision of an improved and simplified device for adjusting the elevation of the inlet mouth above the working surface.

Among the objects of the invention are the provision of simple and convenient devices for changing the elevation of both the brush and the supporting wheels simultaneously but at different rates; the provision of means for changing the elevation simultaneously at the two ends of the nozzle; the provision of mechanism so constructed that the nature of the operation may be simpler and more easily visible than with other devices; the provision of an adjusting support which also permits the ready removal of wheels and brush; while further objects and advantages of the invention will become apparent as the description proceeds.

In the drawing accompanying and forming a part of this application I have shown an illustrative embodiment of my invention wherein Fig. 1 is a side elevation of an electric cleaner containing my improvements; Fig. 2 is a rear elevation of the collecting nozzle detached; Fig. 3 is a bottom plan view of the parts shown in Fig. 2; Fig. 4 is a sectional view corresponding to the line 4—4 of Figs. 2 and 3; and Fig. 5 illustrates the movable element which supports the wheels and brush.

The cleaner herein selected for illustrative purposes comprises a fan-casing 1 and motor-housing 2 rigidly secured together, the fan-casing provided with a centrifugal fan 3 operated by a suitable electric motor (not shown) inside the housing 2, and the forward wall of the fan-chamber being formed, adjacent the face of this fan, with a central opening 4 in which is detachably mounted the neck 5 of a detachable collecting-nozzle 6. This nozzle terminates in a narrow elongated inlet-mouth 7 which is arranged with its plane substantially parallel to the axis of the fan 3 and its major dimension transverse to the fan axis. In the present embodiment this nozzle is detachably secured to the casing, being held by bifurcated brackets 8—8 straddling across pin 9 at one side of the opening 4 in cooperation with a cam-button 10 engaging a lip 11 at the other side of that opening. This detail is not important to some aspects of my invention, and when assembled as illustrated in Fig. 1 this nozzle forms essentially a rigid part of the casing.

Secured to internal brackets 12 carried by the front wall 13 of the nozzle, and adjacent to the ends thereof are the flat metal levers 14 whose

free ends 15 project through narrow vertical slots 16 formed for the purpose in the rear wall 17 of the nozzle. Each of these levers is spaced sufficiently from the end wall 18 to define with said wall a wheel-chamber 19, and the body of each lever 14 is formed with a notch 20 opening through its lower edge and slidably receiving therein the carrier-block 21 whose opposite edges are formed with notches or guideways 22 for the purpose. Located in each of the chambers 19 is a rubber-tired floor-wheel 24 journaled on the horizontal stud 25 with which this block is provided.

Formed on the exterior of the rear wall 17 at equal distances from the center line are abutments 26—26 to which are pivoted on horizontal axes two lever-arms 27—27 having their meeting ends articulated together by a suitable pivot pin 28, and having their outer ends articulated to the ends 15—15 of the levers 14, as by having projections 29 of the one entering suitable apertures 30 formed in the other. Also projecting from the rear wall 17 of the nozzle is a bracket 32 in which is adjustably threaded a vertical screw 33 having at its upper end an adjusting knob 34 which projects into conveniently accessible position relative to the top of the nozzle, and having its lower end resting on one of the levers 27 between the abutment 26 and lever 15. This lever is always held against the end of the screw by means of a suitable spring 35 which has one end secured to the nozzle and the other to one of said levers. The portion of the lever 14 intermediate its ends is expanded vertically sufficiently to cut off the corresponding chamber 19 in large part from the rest of the nozzle while still permitting sufficient angular movement to enable the degree of vertical adjustment requisite for the requirement of different floor coverings.

The degree of adjustment may conveniently be indicated by a scale 36 carried by the rear wall of the nozzle and cooperating with a suitable part of one of the levers, such as one of the projections 29.

I have shown a rotary brush carried by the blocks 21 and driven by the wheels 24 in the manner set forth in my Letters Patent No. 1,395,500, issued November 1, 1921 that is to say: one face of each block is formed with a hollow socket in which is loosely journaled one end of the brush body 41, the extremity of said body being provided with a spur pinion 42 which meshes with teeth formed on the hub 43 of the corresponding wheel. With this construction both wheel and brush can have their elevation adjusted simultaneously, and

in the present embodiment I have formed the sockets 40 closer to the pivots of the levers 14 than the studs 25 on which the wheels are journaled so that the elevation of the wheels and
 5 brush take place according to a differential movement, the vertical movement of the wheels being greater than that of the brush. It will be obvious of course that other means of imparting motion to the brush might be employed within
 10 the scope of my present invention.

Carried by the motor housing at a distance from the wheels 24—24 is a third floor wheel 44 which cooperates therewith to maintain the plane of the inlet mouth 7 approximately parallel to
 15 the supporting surface; and in the present embodiment I have also shown the fan casing as provided with additional wheels 45 as set forth in the application of Lloyd W. Pardee filed February 16, 1929, Serial Number 340,479 which have
 20 the advantage of distributing the weight of the cleaner and reducing its tendency to sink unduly into thick and soft floor coverings. These of course are not necessary to my present invention although advantageous to the general operation
 25 of the cleaner. When employed they should be so located that the vertical adjustment of the wheels 24 may move the peripheries of the latter both above and below that plane which is tangent to the wheels 44 and 45.

30 While I have described in detail this particular cleaner in which my inventive idea is embodied, it will be understood that I do not limit myself to these details except as specifically recited in my several claims which I desire may
 35 be construed each according to the limitations expressed therein and independently of limitations contained in other claims.

Having thus described my invention, what I claim is:

40 1. In a suction cleaner, a casing having a collecting nozzle comprising front and rear walls and end walls defining a narrow elongated downwardly facing inlet mouth, said rear wall being formed
 45 near each end with a vertical slot, a lever movable along each slot and pivoted to the front wall on a horizontal axis, floor wheels and a brush pivoted to said levers inside said nozzle to one side of the pivots of said levers, and means
 50 for rotating said brush, adjusting means carried by the exterior of said cleaner casing and operatively engaging the protruding portions of said levers for simultaneously adjusting the position of said wheels and brush upwardly or downwardly with respect to said nozzle.

55 2. In a suction cleaner, a casing having a collecting nozzle comprising front and rear walls and end walls defining a narrow elongated downwardly facing inlet mouth, said rear wall being formed
 60 near each end with a vertical slot, a lever movable along each slot and pivoted to the front wall on a horizontal axis, floor wheels and a brush pivoted to said levers inside said nozzle to one side of the pivots of said levers, means for rotating said brush, means connecting the protruding
 65 portions of said levers and causing them to move together, and means for adjusting the position of said connecting means and thereby simultaneously adjusting the position of said wheels and brush upwardly or downwardly with respect to said nozzle.

70 3. In a suction cleaner, a casing having a collecting nozzle comprising front and rear walls and end walls defining a narrow elongated downwardly facing inlet mouth, said rear wall being

formed near each end with a vertical slot, a lever movable along each slot and pivoted inside said nozzle on a horizontal axis, floor wheels pivoted to said levers inside said nozzle, lever means articulated to the protruding portions of said first levers, said lever means being pivoted to said exterior of said casing, and means for adjusting and holding said lever means.

80 4. In a suction cleaner, a casing having a collecting nozzle comprising front and rear walls and end walls defining a narrow elongated downwardly facing inlet mouth, said rear wall being formed near each end with a vertical slot, a lever movable along each slot and pivoted to one wall of said nozzle on a horizontal axis, floor wheels located inside said nozzle and pivoted one to each lever on axes which are parallel to the axes of said levers, a second lever articulated to the protruding portion of each of said first levers, each of said second levers being pivoted to the exterior of said casing at a distance from the first lever to which it is articulated, and means for moving and holding said second levers and for causing said second levers to move together.

90 5. In a suction cleaner, a casing having a collecting nozzle comprising front and rear walls and end walls defining a narrow elongated downwardly facing inlet mouth, said rear wall being formed near each end with a vertical slot, a lever movable along each slot and pivoted to one wall of said nozzle on a horizontal axis, floor wheels located inside said nozzle and pivoted one to each lever on axes which are parallel to the axes of said levers, a second lever articulated to the protruding portion of each of said first levers, said second levers being pivoted to the exterior of said casing and also having their ends articulated together, and means for moving and holding said second levers.

100 6. In a suction cleaner, a casing having a collecting nozzle comprising front and rear walls and end walls defining a narrow elongated downwardly facing inlet mouth, said rear wall being formed near each end with a vertical slot, a lever movable along each slot and pivoted inside said nozzle on a horizontal axis, floor wheels located inside said nozzle and pivoted one to each lever on an axis which is parallel to and spaced from the axis of said levers, a brush carried in said nozzle by said levers, said brush being located on the same side of the lever axis as is the axis of said floor wheels, an adjusting screw carried by the exterior of said nozzle, and means transmitting the movement of said screw equally to the protruding portions of said levers and thereby simultaneously adjusting the position of said brush and wheels upwardly or downwardly with respect to said nozzle.

105 7. In a suction cleaner, a casing having a collecting nozzle comprising front and rear walls and end walls defining a narrow elongated downwardly facing inlet mouth, said rear wall being formed near each end with a vertical slot, a lever movable along each slot and pivoted to one wall of said nozzle on a horizontal axis, each of said levers being spaced from an end wall and defining therewith a wheel-chamber, there being a brush chamber between said levers, floor wheels located one in each wheel chamber and pivoted to the adjacent lever, a brush carried by said levers and located in said brush chamber, and adjusting means carried by the exterior of said cleaner casing and operatively engaging the protruding portions of said levers.

110 8. In a suction cleaner, a casing having a col-

lecting nozzle comprising front and rear walls and end walls defining a narrow elongated downwardly facing inlet mouth, said rear wall being formed near each end with a vertical slot, a lever 5 movable along each slot and formed inside said nozzle with a parallel sided recess, each lever being pivoted to one wall of said nozzle on a horizontal axis and having one end projecting out through the adjacent slot, a carrying block 10 removably mounted in each recess, a floor wheel pivoted to each block, and adjusting means carried by the exterior of said cleaner casing and operatively engaging the protruding portions of said levers.

15 9. In a suction cleaner, a casing having a collecting nozzle comprising front and rear walls and end walls defining a narrow elongated downwardly facing inlet mouth, said rear wall being formed near each end with a vertical slot, a lever 20 movable along each slot and pivoted to one wall of said nozzle on a horizontal axis, adjusting means carried by the exterior of said casing and operatively engaging the protruding portions of said levers, supporting blocks removably secured 25 to the portions of said levers inside said nozzle, a brush journaled between said supporting blocks, floor wheels pivoted one to each of said blocks, and operating connections between said wheels and brush.

30 10. In a suction cleaner, a casing having a collecting nozzle comprising front and rear walls and end walls defining a narrow elongated down-

wardly facing inlet mouth, a rotatable brush in said inlet mouth, floor wheels to the rear of said brush concealed by said casing, support means for said wheels and brush pivoted to said casing eccentrically of the axes of said wheels and brush, 80 means accessible at the side of said casing for effecting the adjustment of the inlet mouth with respect to the working surface whereby said brush and wheels may be simultaneously raised or lowered with respect to said nozzle, and means asso- 85 ciated with said support means for visually indicating the adjustment of the inlet mouth with respect to the working surface.

11. In a suction cleaner, a casing having a collecting nozzle comprising front and rear walls 90 and end walls defining a narrow elongated downwardly facing inlet mouth, a rotatable brush in said inlet mouth, floor wheels to the rear of said brush concealed by the said casing, support means for said wheels and brush pivoted to 95 said casing eccentrically of the axes of said wheels and brush, means accessible at the side of said casing for effecting the adjustment of the inlet mouth with respect to the working surface whereby said brush and wheels may be 100 simultaneously raised or lowered unequal amounts with respect to said nozzle, and means associated with said support means for visually indicating the adjustment of the inlet mouth with respect to the working surface. 105

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