Feb. 28, 1933. F. RIEBEL, JR 1,899,423

VACUUM CLEANER

Filed Sept. 9, 1929

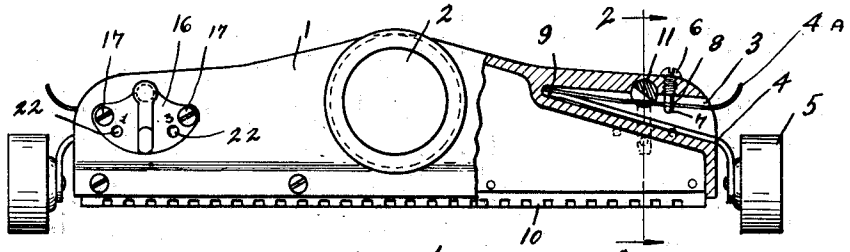


Fig. 1

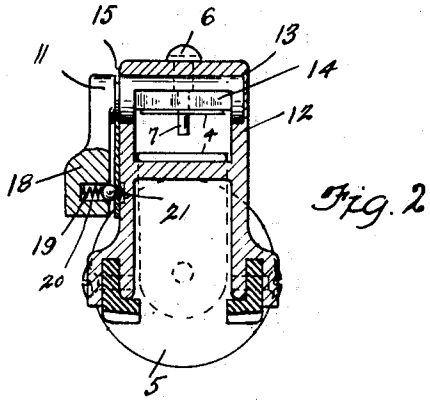


Fig. 2

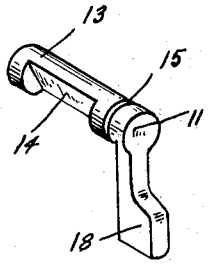


Fig. 3

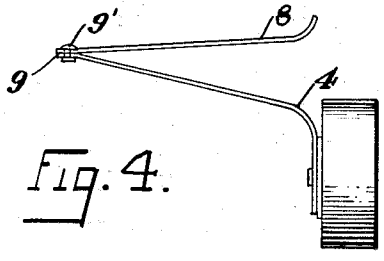


Fig. 4.

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UNITED STATES PATENT OFFICE

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VACUUM CLEANER

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The present invention, relating as indicated to vacuum cleaners, has more specific reference to the floor tools of such cleaners; and has for one of its objects to provide instrumentalities whereby the vertical position of the suction slot or its associated agitators can be accurately regulated relative to the surface over which such cleaner is being operated. Other objects and advantages will appear as the description proceeds.

In one of its embodiments, my invention contemplates providing a vertically movable floor tool with adjustable stops for limiting the pivotal motion of its floor wheel mountings. To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawing and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawing:

Fig. 1 is a combination elevation and sectional view of a suction nozzle embodying the principles of my invention; Fig. 2 is a section taken substantially on a plane indicated by line 2—2 of Fig. 1; Fig. 3 is an isometric view of the cam for regulating the height of the floor wheel mountings. Fig. 4 is a view of a wheel and its supporting means.

Referring to the drawing and more especially to Fig. 1, the suction nozzle 1 is provided with an opening 2 which is normally connected to the suction chamber of a vacuum cleaner, not shown. Said suction nozzle 1 has formed therein end sockets 3 which receive and operatively secure the resilient wheel mountings 5. The resilient mountings 5 each comprise a tang 4 and a leaf spring 4—A secured together at one end as by means of rivets at 9. The tang 4 and spring 4—A are formed so that normally their free ends will be spread apart making a V shaped conformation. Said tangs 4 are removably secured in the sockets 3 by means of a retaining screw 6 which has a downwardly extending reduced end 7 engaging an aperture 8 formed centrally in the spring 4—A. The mountings 5 when they are introduced into the end sockets 3 are under a desired amount of initial tension to hold the floor wheel 5 in the position shown in Fig. 1. The amount of tension in the mountings 5 will regulate the distance between the floor surface upon which the wheels 5 rest and the lower surface 10 of the suction nozzle 1. It will be understood that both the spring 4—A and the tang 4 are constructed of spring material in the form disclosed herein. It is apparent however that the resiliency may be comprised entirely in the spring 4—A while the tang 4 is made of non-resilient material or, on the other hand, the resiliency may be comprised entirely in the tang 4 while the member 4—A may be replaced by a non-resilient strip. The important element of construction in the mounting is that there be resiliency in a mounting comprising a pair of arms secured together in spreading formation. The term "arms" is used to conveniently refer to the spring 4—A and tang 4 collectively.

In cleaning floor surfaces of different types, it becomes necessary to change the distance between the suction nozzle and the surface to be cleaned since it is readily understood that hard surfaces such as wood floors and linoleum require a different adjustment of the suction nozzle with respect to the floor than a floor surface consisting of an oriental rug or other thick pile carpets. To efficiently acomplish this adjustment, I have provided in suction nozzle 1 a cam 11 shown in Fig. 3. The cam 11 is journaled in the walls 12 of the suction nozzle 1 and consists pref-

erably of a cylindrical body 13 having a segment cut away therefrom as shown at 14. The cam 11 has an annular groove 15 formed near one end, the groove 15 being adapted to receive the securing keeper 16 which is attached to the suction nozzle 1 by means of screws 17. The cylindrical member 13 has downwardly extending therefrom an adjustment or controlling lever 18 for rotating the cam 11 in its operative position. The adjusting arm 18 has a spring 19 secured in the recess 20 on the inner surface thereof. The spring 19 with ball 21 coacting with the depressions 22 formed in the securing plate 16 serve to hold the cam 11 in the desired operative position. When the cam 11 extending through the end sockets 3 is rotated, the upper tang 4 of the floor wheel mountings is depressed an amount dependent upon the amount of such rotation. As such cam is rotated and the upper tang 4 correspondingly depressed, the tension between the tangs of the floor wheel mountings is thereby materially increased and the distance between the suction nozzle and the floor is thereby correspondingly regulated.

A very important advantage of adjusting the floor tool by changing the tension of the spring mountings so as to vary the supporting force provided by said spring mountings, is the automatic self adjustment of the floor tool which is thereby secured, in addition to the manual adjustment which is secured by shifting the lever 18.

By applying adjustment to the spring mounting, there is no interference with the resilient movement which the mounting may afford to allow the floor tool to give either upwardly or downwardly in response to the variations in the upward pressure exerted against the floor tool by the nap of the carpet being cleaned.

Other modes of applying the principle of the invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. A vacuum cleaner comprising a floor tool having a socket in the end portion, a mounting comprising a pair of arms including free ends spaced apart vertically and united at their other ends, at least one of said arms being of spring material, a supporting wheel journalled upon the free end of the lower arm, said mounting being received in the socket with its connected portion innermost, and adjustable means engaging the upper arm, to vertically vary the position thereof.

2. A vacuum cleaner comprising a floor tool having a socket in an end portion, a tang mounted in said socket and having a free end projecting therefrom, a supporting wheel journalled upon said free end, resilient means for urging said tang in a direction to oppose the weight of the floor tool when supported upon said wheel, and oscillatory means journalled in the floor tool for adjusting the height at which the floor tool is supported by said wheel, said oscillatory means including a cam engaging said resilient means from above, a lever positioned adjacent an outer face of the floor tool and resilient means carried by said lever and co-acting with the floor tool at said outer face to arrest said oscillatory means in various positions of adjustment.

3. A vacuum cleaner comprising a floor tool having a socket in an end portion, a tang mounted in said socket and having a free end projecting therefrom, a supporting wheel journalled upon said free end, resilient means for urging said tang in a direction to oppose the weight of the floor tool when supported upon said wheel, and oscillatory means journalled in the floor tool for adjusting the height at which the floor tool is supported by said wheel, said oscillatory means including a cylindrical member journalled in opposite walls of the socket and projecting therefrom at one end, and a lever secured to said end, the central portion of said member being formed as a cam engaging said resilient means from above.

4. A portable household vacuum cleaner comprising a suction floor tool having end sockets, a pair of floor wheels, a pair of mounting members each loosely attached to the floor tool in a respective socket, and each having a movable free end projecting from the socket and having a respective floor wheel journalled thereon, a pair of adjusting elements mounted in the floor tool and including movable portions projecting into the respective sockets, and a leaf spring in each socket secured at one end to a respective mounting member and having a free end spaced thereabove and engaged by a respective adjusting element, whereby the floor tool is resiliently carried by the floor wheels through the medium of said springs in a series of normal riding positions determined by the positions of adjustment of said adjusting elements, and the existence of a balance between the weight of the cleaner and the tension of the springs when flexed under said weight, and whereby the floor tool may be depressed below said normal riding positions by supplementing the weight of the cleaner with manual pressure.

5. A portable household vacuum cleaner, comprising a suction floor tool, a pair of floor wheels, a pair of mounting members, each loosely attached to the floor tool near a respective end thereof, and each having a movable free end on which is journalled a floor

wheel, a pair of adjusting elements, and a pair of spring elements each engaged with a respective adjusting element, each adjusting element and its respective spring element being together engaged, in series with each other, between a respective mounting member and the floor tool, and together carrying the weight of a respective half of the floor tool to the respective mounting member, whereby the floor tool is resiliently carried by the floor wheels through the medium of said springs in a series of normal riding positions determined by the positions of adjustment of said adjusting elements and the existence of a balance between the weight of the cleaner and the tension of the springs when flexed under said weight, and whereby the floor tool may be depressed below said normal riding positions by supplementing the weight of the cleaner with manual pressure.

6. A vacuum cleaner comprising a floor tool including sockets in its end portions, a pair of floor wheels, mounting devices each including a tang to one end of which a respective floor wheel is journalled and an apertured leaf spring secured to its opposite end, said mounting devices being received in the respective sockets with said springs positioned adjacent the upper walls of the socket, and oscillatory devices journalled in the floor tool between said leaf springs and the upper walls of the respective sockets, and provided with members for depressing said springs when oscillated to determined positions.

7. A vacuum cleaner comprising a floor tool including sockets in its end portions, a pair of floor wheels, mounting devices each including a tang to one end of which a respective floor wheel is journalled and an apertured leaf spring secured to its opposite end, said mounting devices being received in the respective sockets with said springs positioned adjacent the upper walls of the socket, means mounted in the socket upper walls and projecting through said apertures for securing the mounting devices against endwise removal from the sockets, and oscillatory devices journalled in the floor tool between said leaf springs and the upper walls of the respective sockets, and provided with members for depressing said springs when oscillated to determined positions.

8. A portable household vacuum cleaner, comprising a suction floor tool, a pair of floor wheels, a pair of mounting devices, each attached to the floor tool near a respective end thereof, each having a movable free end on which is journalled a floor wheel, and a pair of adjusting elements engaged between the floor tool and the respective mounting devices and carrying the weight of the floor tool to said devices, each of said devices including a resilient portion interposed between its respective adjusting element and floor wheel and carrying the weight of its respective end of the floor tool from its adjusting element to its floor wheel whereby the floor tool is resiliently carried by the floor wheels in a series of normal riding positions determined by the positions of adjustment of said adjusting elements and the existence of a balance between the weight of the cleaner and the tension of the resilient portions when flexed under said weight, and whereby the floor tool may be depressed below said normal riding positions by supplementing the weight of the cleaner with manual pressure.

Signed by me this 6th day of September, 1929.

FREDERICK RIEBEL, JR.