

Sept. 20, 1932.

D. G. SMELLIE

1,878,901

SUCTION CLEANER

Filed Oct. 1, 1930

Fig. 3.

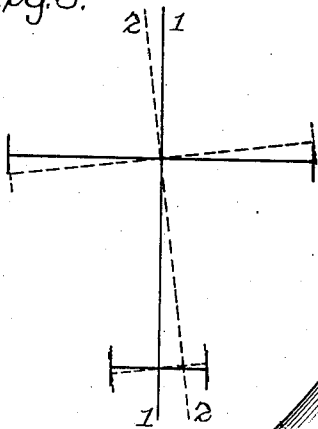


Fig. 1.

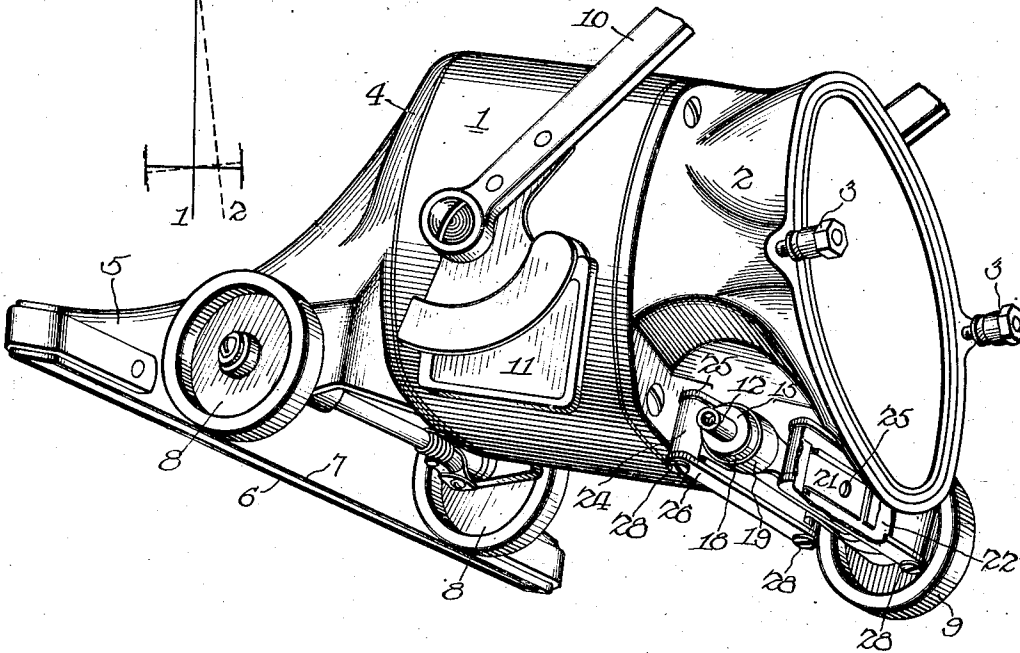
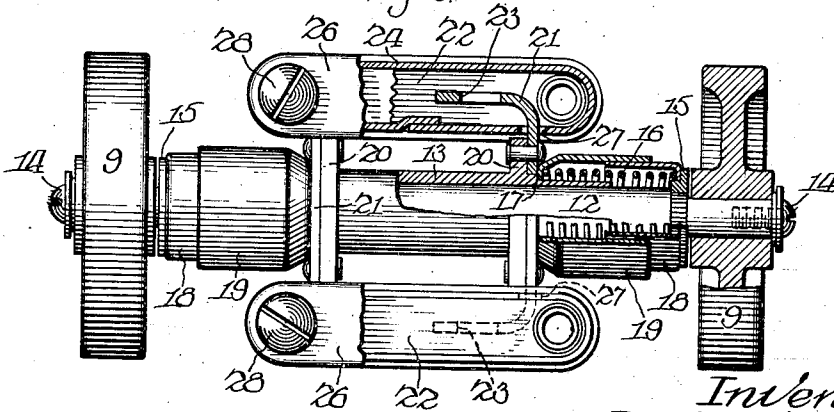


Fig. 2.



Inventor:  
Donald G. Smellie.  
By Harry S. Demaree  
Atty.

# UNITED STATES PATENT OFFICE

DONALD G. SMELLIE, OF CANTON, OHIO, ASSIGNOR TO THE HOOVER COMPANY, OF NORTH CANTON, OHIO, A CORPORATION OF OHIO

## SUCTION CLEANER

Application filed October 1, 1930. Serial No. 485,814.

The present invention relates to suction cleaners and particularly to improved supporting means therefore. More specifically the invention relates to a new and improved rear wheel mounting for a suction cleaner having the desirable characteristic of making easier the turning or change of direction of the cleaner and also of being able to accommodate unevenness in the supporting surface through being angularly adjustable in a vertical plane.

It is an object of the present invention to provide a new and improved wheel support for a suction cleaner. Another object is to provide a new and improved compensating castor support for a suction cleaner. Still another object is the provision of an improved support for a suction cleaner which increases the usefulness and ease of operation of the cleaner through making easier changes in the direction of cleaner travel. A still further object is the provision, in a suction cleaner, of resiliently mounted supporting means. Other and more specific objects will appear upon reading the following specification and considering in connection therewith the drawing attached thereto.

Referring now to the drawing:—

In Fig. 1 a modern suction cleaner is shown in perspective with the present invention embodied therein and one of the supporting wheels removed.

Fig. 2 discloses a bottom view of the present invention as embodied in Fig. 1 with certain parts broken away and shown in section for the purpose of greater clarity.

Fig. 3 is a diagrammatic disclosure of the operation of a suction cleaner embodying the present invention in changing its direction of travel.

In the drawing the present invention is disclosed embodied in a modern suction cleaner which comprises a main casting 1 which houses a driving motor for the cleaner and which also provides an exhaust air passage therearound which leads to the exhaust outlet 2 which is provided with suitable means 3, 3 by which a dust bag or dirt receptacle can be attached. Forward of the main casing 1 is the unit casting which com-

prises a fan chamber 4 and a suction nozzle 5 having front and rear lips 6 and 7. The cleaner is movably supported by means of spaced front supporting wheels 8, 8 and by rear supporting wheels 9, 9 which are carried by the suction cleaner and more specifically on the underside of the exhaust outlet 2 in a manner which forms the present invention. A handle 10 is provided, as in the usual suction cleaner, by which the cleaner may be propelled over the surface covering undergoing cleaning by the operator and means, indicated generally by the reference character 11, are provided to resistingly maintain the handle 10 in any given position in the absence of positive rotating force on said handle. No invention is claimed in the general arrangement of the suction cleaner and the present application is directed to a new and improved mounting for the rear supporting wheels 9, 9 which support the rear end of the suction cleaner in a manner to be hereinafter more fully described.

The rear supporting wheels 9, 9 are rotatably supported upon the reduced ends of a shaft 12 which is itself slidingly positioned in a central housing or bearing member 13. Wheels 9, 9 are retained on the supporting axle 12 by suitable means such as screws 14, 14 which are threaded into a threaded bore in the end of the axle. Rings 15, 15, which are forced upon the axle 12 and are rigidly carried thereby, limit the inward displacement of the wheels 9, 9 upon the axle and perform the further useful function of providing an outer seat or retainer for the coil springs 16, 16, of which only one is shown, which are positioned between each ring 15, 15 and a suitable shoulder 17 formed upon the housing 13. The coil springs 16 function to maintain the axle 12, and so the supporting wheels, in substantially mid-position of the supporting housing 13. Suitable cups 18 and 19 are held by each spring 16 against the retainer members 15, 15 and the shoulders 17, 17 and, being slidable relative to one another through being positioned in concentric relationship, form suitable protecting means and dust housings for the

springs 16, 16 while no way preventing the movement of shaft 12.

Housing 13 is provided exteriorly with projections of increased radius which are indicated by the reference characters 20, 20 which provide supporting means for a pair of transversely extending U-shaped arms 21, 21. The arms 21, 21 are each shown as being formed in one piece and enclosing the frame 13 adjacent the supports 20, 20. The opposite ends of the supporting arms 21, 21 extend inwardly and substantially parallel to the axis of the housing 13 and are embedded within resilient bodies of rubber which are indicated generally by the reference character 22, 22. Each arm 21 is provided with an opening 23 near its outer end for the purpose of enclosing a section of the supporting rubber to provide a firmer foundation and to prevent relative movement thru slipping. The body of rubber 22, 22 may be molded about the supporting arms 21, 21 or may be formed in suitable shapes so that they can be assembled thereon. Each body of rubber 22 is suitably housed within a container housing comprising a side wall 24, and top and bottom caps 25 and 26 which, with the exception of the slots 27, 27 formed in the axle sides of the walls 24, 24 for the purpose of permitting vertical movement of the supporting arms 21, 21 totally enclose the body of resilient material and substantially prevent deterioration thereof thru contact with the exterior atmosphere. Attaching means 28, 28 etc. are provided which extend thru the housings including the resilient supports for the arms 21, 21, into the underside of the exhaust outlet 2 of the cleaner and serve to maintain the assembly in position relative thereto.

In the operation of a suction cleaner it is often desirable to change the direction of movement in order to avoid certain obstacles, to reach a different location, or solely for the purpose of advancing over a new area of the surface covering for the purpose of cleaning. With the ordinary suction cleaner provided with supporting means of the rotary type in which no provision has been made for such a variation in the direction of travel it becomes necessary, by means of a force exerted through the cleaner handle, to slide, in the sense of moving sideways, either the front supporting wheels or the rear supporting wheels over the covering. The operation of such a cleaner discloses that while little effort is required to move a cleaner where rotation of the supporting wheels will accomplish that movement that a considerably greater force is required where the movement is of a transverse nature requiring the pushing sideways of the cleaner upon the covering.

With the suction cleaner embodying supporting means constructed in accordance with the present invention, the change in the di-

rection of advance is accomplished with as little expenditure of effort as accompanies the forward movement of the cleaner. If, for example, it is required or desired to change the direction of movement of the cleaner from a first direction such as indicated by the line 1-1 of Figure 3 to a direction indicated by the line 2-2 of the same figure, it is only necessary to force the handle of the cleaner slightly to the right, the housing or bearing 13 sliding to the right upon the supporting axle 12 compressing the spring 16 upon its right hand side and permitting the spring 16 on the opposite side to be extended. This transverse movement of the bearing 13 upon the axle 12 does not result in the sliding of the wheels 9, 9 over the surface covering but instead results in the axle 12 being slightly rotated with the accompanying rotation of the wheels 9, 9 as is clearly indicated by Figure 3 by the full and dotted line positions. Inasmuch as it is not possible to change the position of the rear end of the cleaner without an accompanying change in the forward end it is evident that in the change from a position indicated by the line 1-1 to that of the line 2-2 the front end of the cleaner will also be rotated thru a slight angle, the center point of the front axle being the pivot point of that rotation. With the cleaner positioned as indicated by the dotted lines it is clear that a forward push will advance it to the left of its first direction of travel.

It is apparent then that the change in the direction of travel of the cleaner has been accomplished with an entire absence of any slipping of the supporting means over the surface covering. It should be pointed out that it is entirely probable that upon the advance of the cleaner in its new direction of travel, as indicated by the line 2-2, that the force exerted by the compressed coil spring 16 upon the right hand side of the housing 13 would gradually result in the re-centering of the axle 12 relative thereto. This relative movement would be gradually accomplished as the cleaner was rolled over the surface covering and would not be accompanied by an appreciable energy requirement.

It is also apparent that with the supporting means constructed in accordance with the present invention the resilient mountings of the axle supporting arms 21, 21 provide for a limited tilting of that axle and so it is that upon encountering an uneven supporting surface that the rear supporting wheels accommodate themselves thereto thru a slight angular adjustment in a vertical plane with a resulting sliding of the supporting arms 21, 21 thru the slots 27, 27 etc., in the walls 24, 24 that enclose the resilient supporting means.

I claim:—

1. In a suction chamber of the movable type a body, supporting means therefor comprising a wheel, an axle rotatably supporting

said wheel, means slidably supporting said axle, and other means movably supporting said last mentioned means on said body.

2. In a suction cleaner of the movable type a body, supporting means therefor comprising a wheel, an axle for said wheel, means supporting said axle for horizontal sliding movement, second means supporting said body, characterized by the fact that said second means resiliently and resistingly oppose angular movement of said axle relative to said body.

3. In a suction cleaner a body, a spaced front supporting wheels for said body, spaced rear wheels for said body, an axle for said rear wheels, means between said wheels slidably supporting said axle, and means supporting said first mentioned means for angular movement relative to said body.

4. In a suction cleaner a body, spaced front supporting wheels for said body, a rear wheel for said body, an axle rotatably supporting said rear wheel, means supporting said axle for horizontal movement, a body of resilient material carried by said cleaner body, and means carried by said resilient body supporting said first mentioned means for angular movement relative to said body.

5. In a suction cleaner a body, front supporting wheels for said body, a rear wheel for said body, an axle rotatably supporting said rear wheel, means slidably supporting said rear axle, resilient means opposing sliding of said axle, a body of resilient material carried by said cleaner body, and means embedded in said resilient means movably supporting said axle-supporting means.

6. In a suction cleaner a body, front supporting means for said body, rear supporting wheels for said body, a common axle for said rear wheels, a housing for said axle slidably positioning said axle, coil springs enclosing said axle on opposite sides of said housing resiliently maintaining said axle in a definite position, supporting arms extended at the sides of said housing and resilient supports carried by said cleaner body carrying the ends of said arms.

7. In a suction cleaner a body, a supporting wheel, means supporting said wheel for horizontal transverse sliding movement relative to said body, and second means supporting said wheel for angular movement relative to said body.

Signed at North Canton, in the county of Stark and State of Ohio, this 26th day of Sept. A. D., 1930.

DONALD G. SMELLIE.

**CERTIFICATE OF CORRECTION.**

**Patent No. 1,878,901.**

**September 20, 1932.**

**DONALD G. SMELLIE.**

**It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, line 128, claim 1, for the word "chamber" read cleaner; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.**

**Signed and sealed this 29th day of November, A. D. 1932.**

**(Seal)**

**M. J. Moore,  
Acting Commissioner of Patents.**