C. H. BEACH.

VACUUM CLEANER.

APPLICATION FILED JUNE 9, 1913.

1,093,820. Patented Apr. 21, 1914.

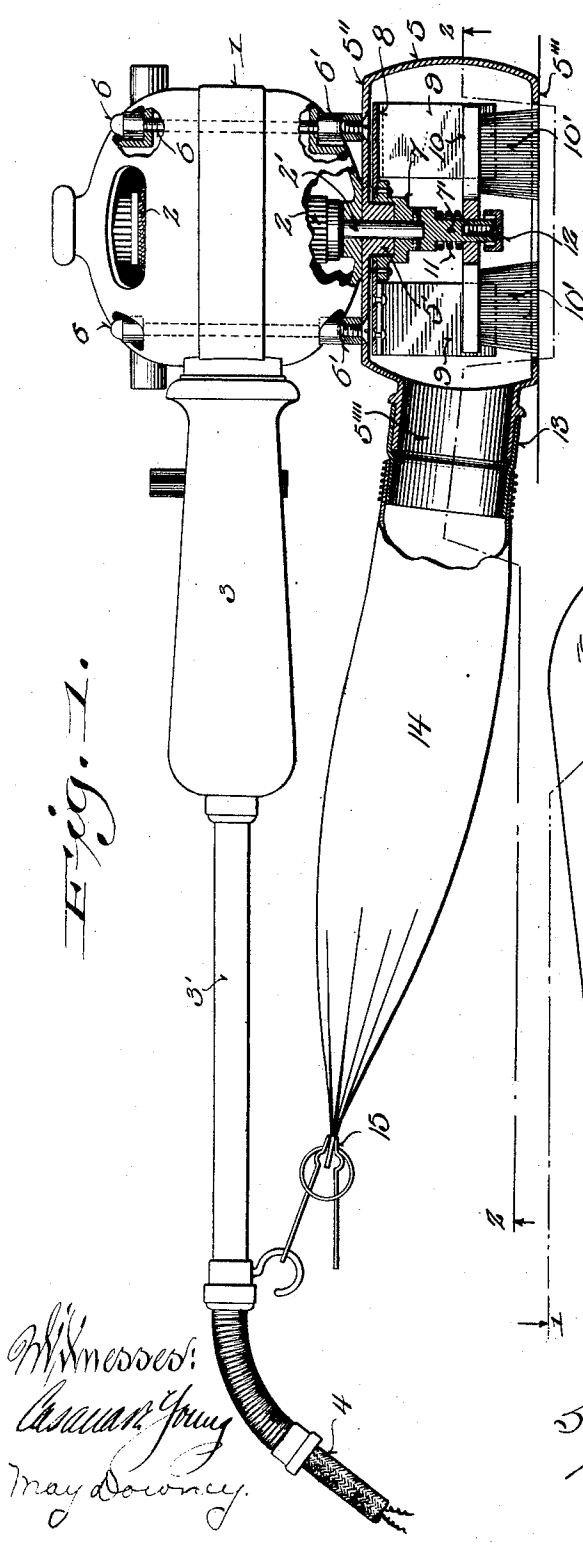

Fig. 1.

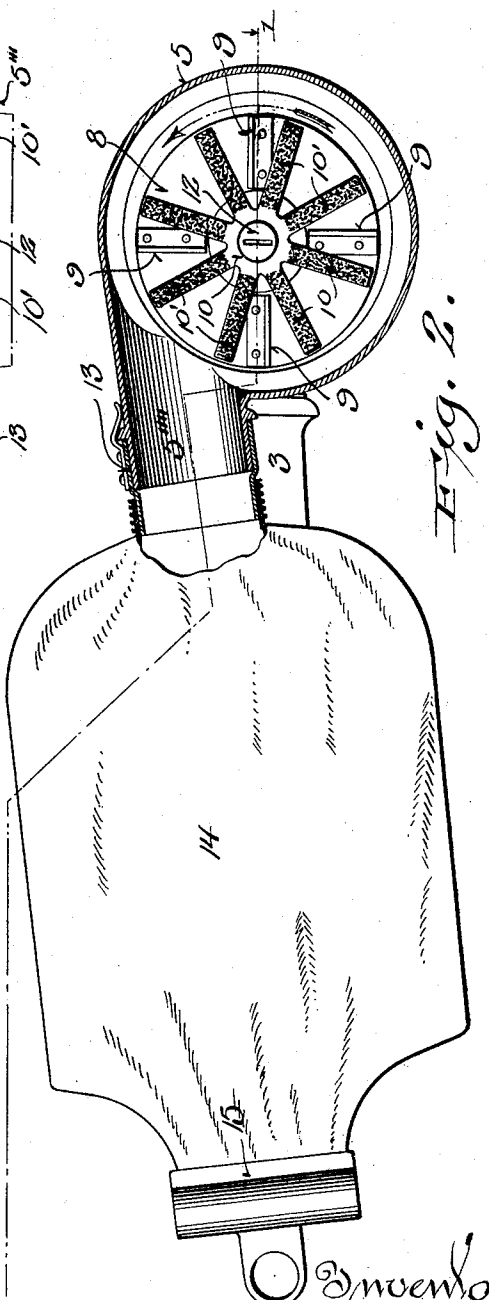

Fig. 2.

Witnesses:
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UNITED STATES PATENT OFFICE.

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VACUUM-CLEANER.

1,093,820. Specification of Letters Patent. **Patented Apr. 21, 1914.**

Application filed June 9, 1913. Serial No. 772,463.

To all whom it may concern:

Be it known that I, CHESTER H. BEACH, a citizen of the United States, and resident of Racine, in the county of Racine and State of Wisconsin, have invented certain new and useful Improvements in Vacuum-Cleaners; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention has for its object to provide a simple, economical and light-weight vacuum cleaner of miniature type for hand use, the same being particularly designed to take the place of whisk-brooms or analogous devices for cleaning clothing, or various articles not including floors or carpets, as, for example, the felt surfaces of game tables, and to meet the various requirements as to the scope of the cleaner I also provide certain detachable members that can readily be interchanged by the user.

With the above objects in view the invention consists in what is herein shown, described and claimed.

In the drawings Figure 1 represents a side elevation of a vacuum-cleaner embodying the features of my invention, parts of the machine being broken away and in section to more clearly illustrate structural features, which sectioned parts are indicated by line 1—1 of Fig. 2, and Fig. 2, an inverted sectional plan view of the same, the section being indicated by line 2—2 of Fig. 1.

Referring by characters to the drawings, 1 represents a housing containing an electric motor 2, the said housing being provided with a grip-handle 3 having a tubular stem 3′ that carries the usual feed-wires 4 for supplying energy to the motor. The shaft 2′ of the motor projects through the lower face of the housing and also through an eccentrically disposed boss 5′ of a circular casing 5, the same being in the form of an inverted cup having its bottom wall secured to the lower face of said housing by bolts 6. The bolts pass through apertures in the housing and engage feet 6′, the same being secured to the bottom wall 5″ of the cup-like housing by screws as shown. The mouth of the casing is provided with an inturned lip 5‴, which lip extends around the casing edge being concentric with the motor axis, and forms an air intake opening. The casing is also provided with an air discharge nozzle 5⁗, which nozzle extends at a tangent to the side wall of the casing.

Fitted over the casing boss 5′ is a cupped hub 7, a flange of which hub carries a fan disk 8 that has secured to its lower face a series of depending vanes 9, the disk and vanes constituting a fan. The hub 7 of the fan is secured to an extension of the motor-shaft 2′ by set-screws and is provided with a reduced shaft-extension 7′.

Loosely mounted upon the shaft etxension 7′ is a spider 10, the arms of which spider constitute heads for depending brushes 10′, the working or brushing faces of which brushes normally project slightly below the plane of the casing mouth. The brush spider is capable of longitudinal yield in opposition to tension of a coiled spring 11 that surrounds the shaft extension 7′, the said spring being interposed between a shoulder of the fan hub and upper face of the spider, whereby said spider is seated against the flanged head of a set-screw 12, which set-screw is in threaded union with the motor-shaft extension. Thus by adjusting the set-screw 12 the working or brushing face of the brush may be regulated with relation to the mouth of the fan-casing.

The discharge nozzle 5⁗ has detachably secured thereto a thimble 13, the thimble forming a rigid receiving mouth for a porous dust-collecting sack 14, which is attached thereto. The opposite end of the sack or separator is left open for the purpose of emptying the deposits of dust that may accumulate therein and in its operating position the open end is closed by a spring-clip 15, which clip is suspended from a hook that extends from the handle stem 3′.

In the operation of the cleaner as exemplified above, the operator grasps the machine in one hand and directs the same over the surface or clothing either of the operator or others. Current being supplied to the motor, it is apparent that the fan will be rotated and its vanes which project between the spider arms will cause simultaneous rotation of the brush. The flanged mouth of the fan casing in the meantime is slowly moved over the surface to be cleaned. Thus the dust is positively loosened from the fabric and coincident thereto the partial vacuum produced causes the dust-laden air to be drawn into the casing and discharged therefrom into the separator sack, from which point the air is exhausted to atmosphere through the pores of

the latter. It is also obvious that in operation the brush bristles are pressed into contact with the surface to be cleaned by the coiled spring 11, the said brush being capable of slight rise and fall as it follows the contour of the surface over which the shell mouth travels. The cleaner may also be utilized for various other purposes wherein it is desirable to first subject the material to a positive brushing operation, as, for example, it may be utilized for cleaning animals or various surfaces where hand manipulation is desirable. It is also apparent that by the peculiar attachment of the spider brush in connection with the fan, as shown in Figs. 1 and 2 of the drawings, said brush can be readily removed when it is desired to utilize the machine as a suction cleaner only and that the pressure of the brush can be regulated by adjusting said brush up or down.

I claim:

1. A vacuum cleaner comprising a housing having a handle extended therefrom, a motor mounted within the housing having a shaft extension, an inverted cup-like casing secured to one face of the housing through which the shaft extension protrudes, a brush-carrying spider mounted upon the shaft extension and revoluble therewith, and means for permitting longitudinal yield of the spider upon said shaft extension.

2. A vacuum cleaner comprising a housing having a handle extending therefrom, a motor mounted within the housing having a shaft extension, an inverted cup-like casing secured to one face of the housing through which the shaft extension protrudes, a fan secured to the shaft extension having vanes extending downwardly, a spider loosely mounted upon the shaft extension, the spider being disposed in the path of travel of the fan vanes, bristles extending from the spider having their brushing ends normally exposed slightly below the plane of the mouth of the casing, and a coiled spring surrounding the shaft extension adapted to exert pressure against the spider.

3. A vacuum cleaner comprising a housing having a handle extension therefrom, a motor mounted within the housing having a shaft extension, an inverted cup-like casing secured to one face of the housing through which the shaft extension protrudes, a fan secured to said shaft extension having vanes extending downwardly, a spider mounted upon the shaft extension, means for causing the spider to revolve with the shaft, bristles carried by said spider, a coiled spring surrounding the shaft extension adapted to exert downward pressure upon the spider, and adjustable means carried by the aforesaid shaft extension for limiting movement of said spider.

4. A vacuum cleaner comprising a housing having a handle extending therefrom, a motor mounted within the housing having a shaft extension, an inverted cup-like casing depending from the housing through which the shaft extension protrudes, a fan secured to the shaft extension having vanes extending downwardly, a spider loosely mounted upon the shaft extension, the spider being disposed in the path of travel of the fan vanes, bristles extending from the spider having their brushing ends normally exposed slightly below the plane of the mouth of the casing, and a spring carried by the aforesaid shaft extension adapted to exert pressure upon the spider.

In testimony that I claim the foregoing I have hereunto set my hand at Racine in the county of Racine and State of Wisconsin in the presence of two witnesses.

C. H. BEACH.

Witnesses:
L. H. HAMILTON,
H. A. NASH.