E. E. MELLENTHIN.

VACUUM CLEANER.

APPLICATION FILED FEB. 10, 1921.

1,400,448.

Patented Dec. 13, 1921.

2 SHEETS—SHEET 1.

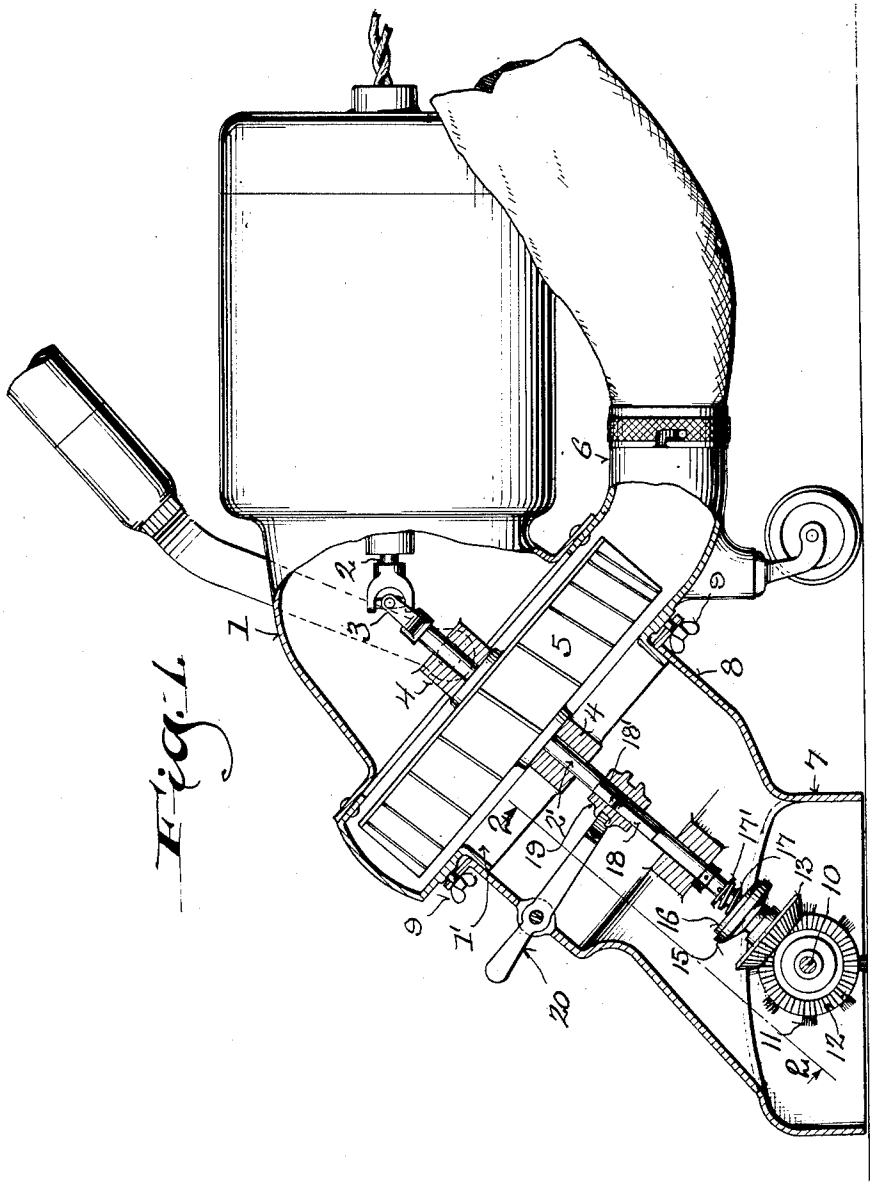

Fig. 1.

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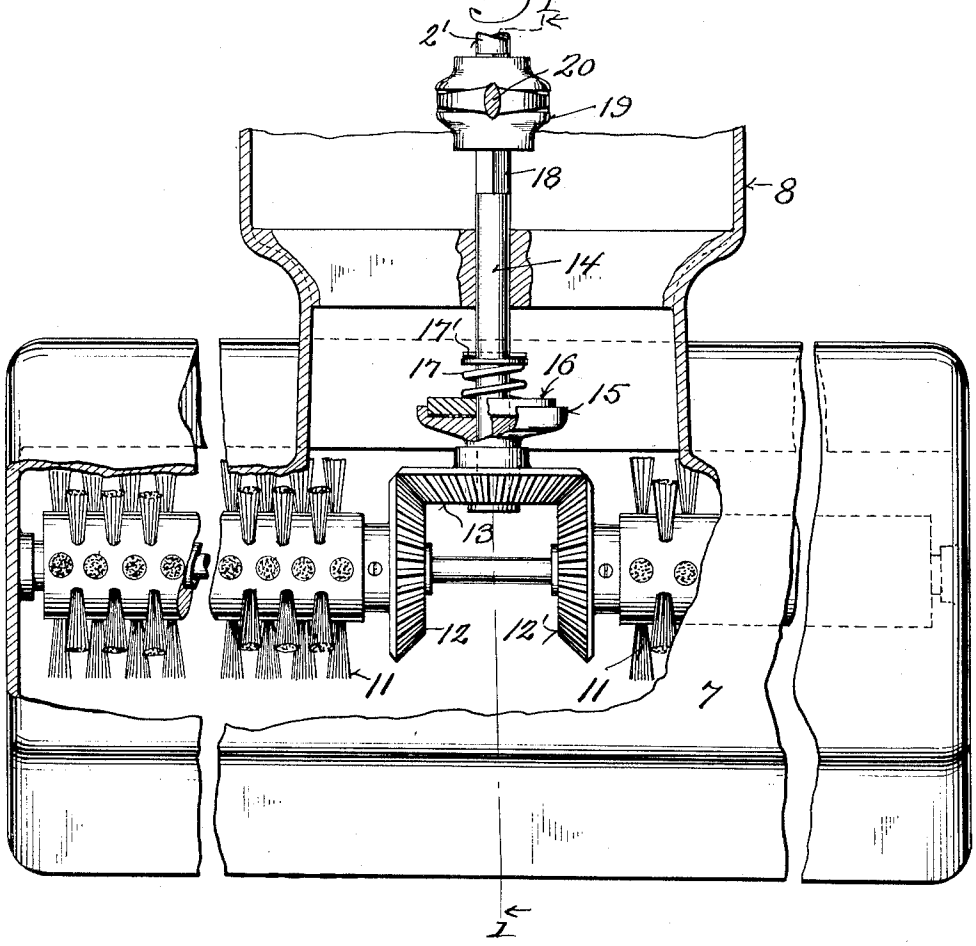
2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

EDWIN E. MELLENTHIN, OF WAUKESHA, WISCONSIN.

VACUUM-CLEANER.

1,400,448. Specification of Letters Patent. Patented Dec. 13, 1921.

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To all whom it may concern:

Be it known that I, EDWIN E. MELLENTHIN, a citizen of the United States, and resident of Waukesha, in the county of Waukesha 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 refers to vacuum cleaners, and has for its primary object to provide a simple, economical and effective cleaner wherein an attachment or suction shell carrying brushes can be fitted thereto, whereby the device is capable of cleaning by a combination of suction and positively sweeping at the same time.

Another object of the invention is to provide means whereby the sweeping attachment mounted in the suction shell can be removed for substitution of a suction shell only.

Another object of my invention is to provide means for coupling the interchangeable suction units to the head portion of the apparatus, whereby the fan shaft can be readily coupled to the brushes for the purpose of driving them in synchrony with the suction fan, or the brushes can be disconnected.

With the above objects in view, the invention consists in certain peculiarities of construction and combination of mechanical elements, as are hereinafter described with reference to the accompanying illustrations and subsequently claimed.

In the drawings:

Figure 1 represents a side elevation of a vacuum cleaner embodying the features of my invention, parts of the same being broken away and in section, as indicated by line 1—1 of Fig. 2, and

Fig. 2 is a detail plan sectional view with parts broken away to more clearly show details of construction pertaining to the brush mechanism, the section being indicated by line 2—2 of Fig. 1.

Referring by character to the drawings, 1 represents a hollow head carrying an electric motor in its rear portion, which motor is not shown. The motor driven shaft 2 2′ is designed in two sections, as shown, which sections at their intersecting point are connected by universal coupling 3. The lower or fan section 2′ of the motor shaft is journaled in bearings 4 4 between which bearing is mounted any type of standard fan 5, which fan is adapted to create suction through a neck portion 1′ of the hollow head and to discharge through a pipe 6 that is tangentially disposed with relation to the lower neck portion of the head.

A suction shell 7 is provided having a throat portion 8 extending therefrom, the mouth of which throat portion is adapted to have telescopic union with the neck terminal of the head, whereby a comparative tight slip joint is effected between these parts to form a continuous passage for the intake of dust-laden air. The throat portion of the suction shell is rigidly secured in its adjusted position by suitable screws and thumb nuts 9 9, which are associated with the head neck.

Transversely mounted in the lower portion of the suction shell is a shaft 10, upon which shaft is loosely mounted a pair of brushes 11 11, the hubs of which have secured thereto beveled gear wheel 12 12′. The companion gear wheels are meshed with a common drive beveled gear wheel 13, which is loosely mounted upon a drive shaft 14, the same being journaled in the throat portion of the shell in axial alinement with the shaft unit 2′.

The beveled wheel 13 is formed with a cupped hub 15, the inner face of which hub is frictionally engaged by a disk 16 that is splined upon the shaft 14, so as to revolve therewith, but adapted to have longitudinal play thereon. The disk 16 is held in frictional contact with the cupped hub by means of a coil spring 17, which is interposed between the disk and a collar 17′ suitably secured against end play upon the shaft. This mechanism constitutes a slip clutch whereby when the peripheral pressure upon the brushes, due to their speed and contact with the surface, becomes too great, the clutch will permit slippage or yield and thus the brushes will not tend to mar or burnish the surface over which they are traveling.

The ends of the alined drive shaft 14 and motor shaft section 2′ are in approximate abutting relations, and are squared as shown at 18 18′ in Fig. 1 of the drawings. One of the squared sections, 18 in this instance, is of greater length than its companion, and there is mounted upon the squared section 18 a coupling sleeve 19 having a central annu-

lar recess for engagement with the spannered end of an actuating lever 20, which lever extends through a slot in the shell neck and is pivoted by the ears of the same.

As shown, the shaft section 2′ of the motor and the drive shaft 14 are in alinement and disposed at a predetermined angle with relation to the horizontally disposed motor shaft unit 2. Hence, when the motor is started, the motion is imparted to the shaft unit 2′ and the drive shaft 14 through the ring sleeve coupling, whereby the fan and brushes are positively driven at a uniform speed and slippage of the brushes is possible, due to the coupling connections previously mentioned. When the parts are thus driven, the rotary brushes revolving in opposite directions will thoroughly agitate the dust particles over the surface upon which the brushes are driven, and said particles will thereafter be drawn up by the partial vacuum through the throat and neck being discharged into the pipe 6 in the usual manner.

Should it be desired at any time to discontinue the use of the brushes and operate the suction alone, the lever 20 can be shifted so as to disconnect the shaft 14 from its associated shaft unit 2′, whereby the fan alone will be driven by the motor and the brushes will simply revolve idly. Thus, it will be seen that the vacuum cleaner, as a whole, can be employed wherein positive brushing and agitation from the brushes is combined with a suction produced by the fan, or the brushes can be disconnected.

Should it be desired for certain purposes to adjust other suction shells to the head, the shell containing the brushes can be quickly removed by disconnecting the throat portion of the suction shell from the neck of the hollow head, and a special suction shell can then be substituted for the one just removed.

While I have described one exemplification of my invention in all of its detail, it is understood that I may vary the structural features within the scope of the claims.

I claim:

1. In a vacuum cleaner having a hollow head provided with an intake neck and a tangentially disposed discharge pipe, a motor driven shaft journaled in the hollow head and a fan mounted on the shaft; the combination of a suction shell having a throat detachably secured to the head neck, a transversely disposed shaft mounted in the shell body, brushes loosely mounted upon the shaft, opposed beveled gears secured to the brushes, a drive shaft journaled in the shell throat in axial alinement with the motor shaft, a bevel gear carried by the drive shaft in meshed engagement with the brush beveled gears, and means for coupling the drive shaft and motor shaft together.

2. In a vacuum cleaner having a hollow head provided with an intake neck and a tangentially disposed discharge pipe, a motor driven shaft journaled in the head and a fan mounted on the shaft; the combination of a detachable suction shell having a throat secured to the head neck, a drive shaft journaled in the shell coupling, means for connecting the drive shaft and motor driven shaft, revoluble brushes mounted in the shell, and a gear connection between the brushes and drive shaft.

In testimony that I claim the foregoing I have hereunto set my hand at Milwaukee, in the county of Milwaukee and State of Wisconsin.

EDWIN E. MELLENTHIN.