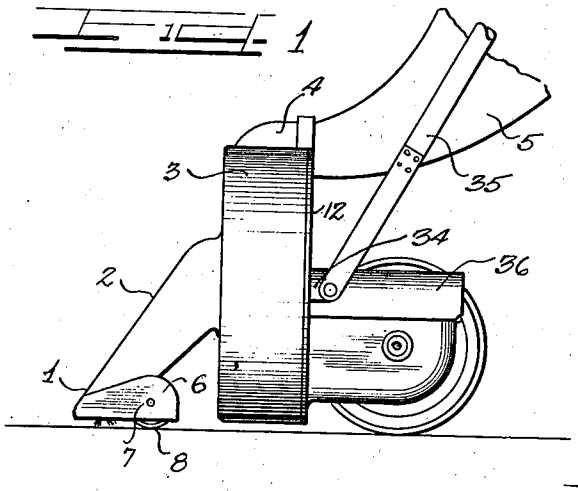
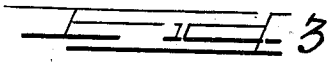
Dec. 14, 1926. 1,610,384

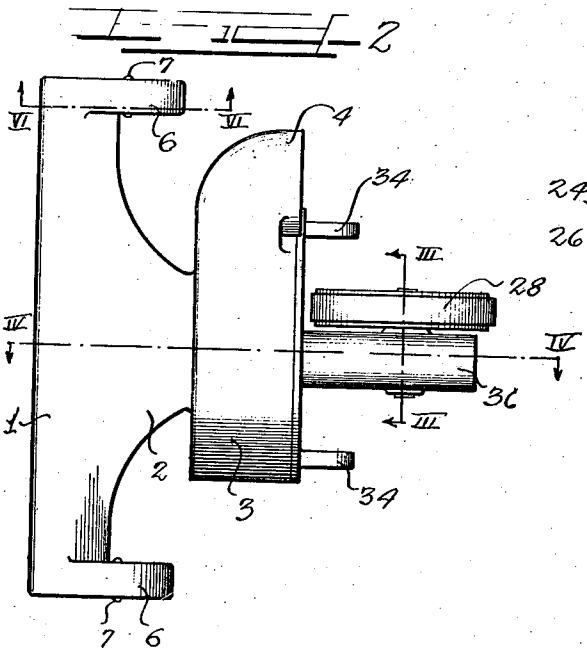
F. G. LINDGREN

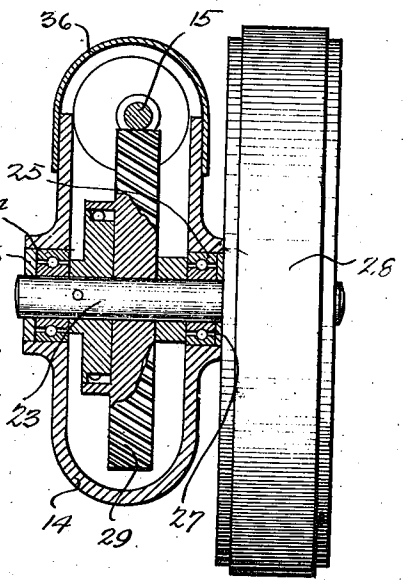
VACUUM CLEANER

Filed Oct. 28, 1925 2 Sheets-Sheet 1









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Dec. 14, 1926.

1,610,384

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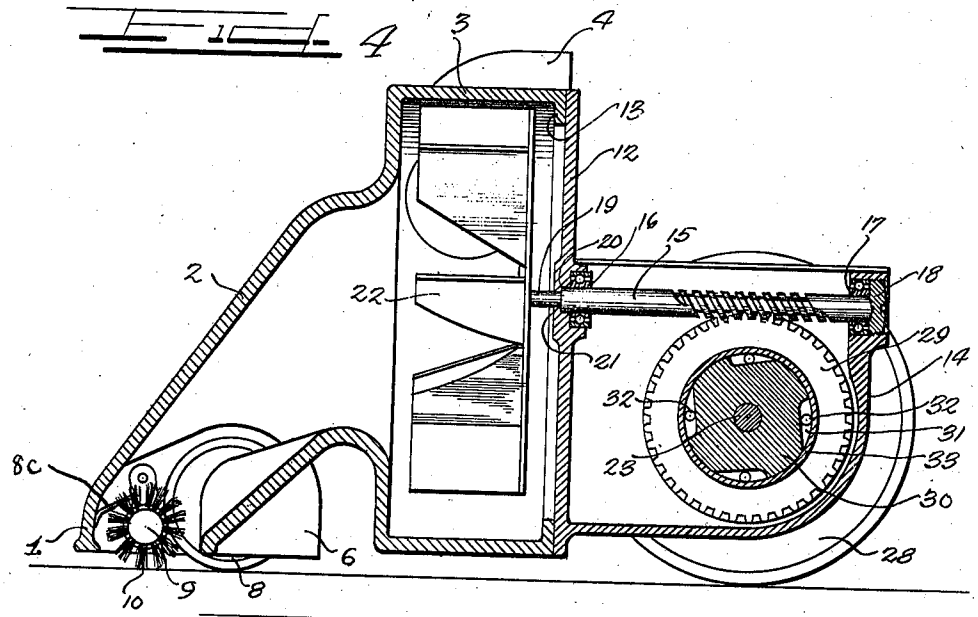
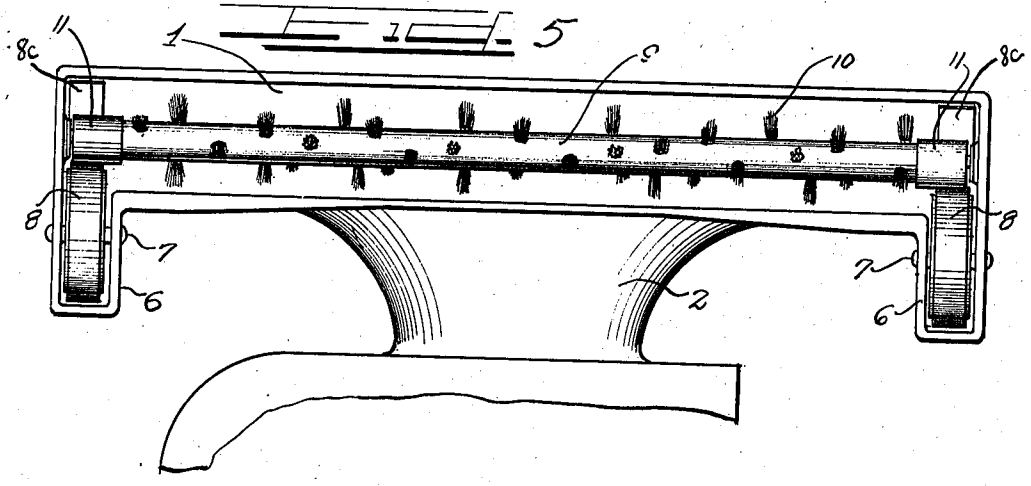
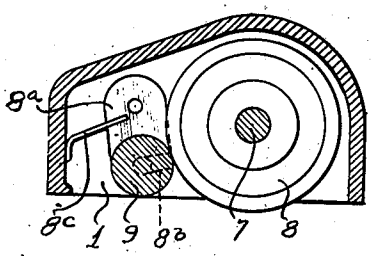
VACUUM CLEANER

Filed Oct. 28 1925 2 Sheets-Sheet 2







INVENTOR

Frank G. Lindgren

BY

Attys

Patented Dec. 14, 1926. 1,610,384

UNITED STATES PATENT OFFICE.

FRANK G. LINDGREN, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO QUALITY HARDWARE AND MACHINE CO., A PARTNERSHIP CONSISTING OF H. A. LAYSTROM, JERRY ANDERSON, CARL SCHWARTZ, AND JOSEPH HECKENBACH, OF CHICAGO, ILLINOIS.

VACUUM CLEANER.

Application filed October 28, 1925. Serial No. 65,301.

This invention relates to vacuum cleaners in general and more particularly to mechanically operated vacuum cleaners.

It is an object of this invention to provide an efficient, mechanically driven vacuum cleaner which may be simply and economically manufactured and conveniently operated.

Other and further important objects of this invention will be apparent from the disclosures in the specification and the accompanying drawings.

This invention (in a preferred form) is illustrated in the drawings and hereinafter more fully described.

On the drawings:

Figure 1 is a fragmentary, elevational view, with parts omitted, showing a device embodying this invention;

Figure 2 is a plan view, with parts omitted, of the device of Figure 1;

Figure 3 is an enlarged sectional view showing parts omitted and parts in elevation taken at the line III—III of Figure 2;

Figure 4 is an enlarged sectional view, with parts omitted, taken at the line IV—IV of Figure 2;

Figure 5 is an enlarged, fragmentary bottom plan view of the forepart of Figure 4; and

Figure 6 is an enlarged vertical section, with parts omitted, taken at the line VI—VI of Figure 2.

As shown on the drawings:

A transverse, downwardly open nozzle mouth 1 is connected with an integral, upwardly extending neck 2 to a cylindrical fan housing 3. The housing 3 is closed at its forward end and is integrally connected at the central portion of said end to the upper end of the neck 2. The neck 2 diverges from the housing 3 to the mouth 1. Extending from the periphery of the housing 3 and communicating with the interior thereof is a rearwardly bent connection 4 open at its rearward end and adapted to be connected to the lower end of a dust bag 5. Oppositely positioned on either end of the mouth 1 and integral therewith are wheel chambers 6. The lower edges of the wheel chambers 6 are flush with the lower edges of the mouth 1. The chambers 6 are each provided with a transverse pin 7 on which is rotatably mounted a rubber tired roller 8, the periphery of which extends slightly below the lower edge of said chamber. On either side of the mouth 1 is a depending link 8^a which is pivoted at its upper end to the inner side of the wall of said mouth. Adjacent the lower ends of each link 8^a is provided a substantially horizontal slot 8^b which extends from the rear edge of said link. Transversely journalled and removably secured in the slots 8^b across the mouth 1 is a brush shaft 9. The brush shaft 9 is provided with radially extending bristles 10 which extend below the lower edges of the mouth 1 sufficiently to lightly brush a rug or the like under the rollers 8 when the shaft 9 is rotated. Rigidly secured on each end of the shaft 9 is a collar 11. The shaft 9 through the collars 11 frictionally engages with the rubber tires on the peripheries of the rollers 8 and is yieldingly held in such engagement by means of springs 8^c, one of which is secured in the forward edge of each link 8^a and extends outwardly therefrom to abut the forward inner wall of the mouth 1.

A circular plate 12 is suitably secured to an annular, inwardly extending flange 13 at the rearward end of the housing 3. Integral with the plate 12 is a rearwardly extending housing 14 constituting an extension of the fan housing 3 which—as shown in Figure 3—has a substantially U-shaped cross-section. Journalled between the center of the plate 12 and the rear end of the housing 14 is a worm shaft 15 which rotates at its forward end on a ball bearing unit 16 and at its rearward end on a ball bearing unit 17. A nut 18, threaded in the housing 14, bears against the rear end of the shaft 15 and holds said shaft against rearward thrust. A reduced portion 19 formed at the forward end of the shaft 15 provides a shoulder 20 which abuts a flange 21 on the plate 12 for holding said shaft against forward thrust. Rigidly secured on the forward end of the reduced portion 19 is a centrifugal fan 22. Transversely journalled in the housing 14 is a shaft 23 which bears upon ball bearing units 24 and 25 secured in the two opposite sides respectively of said

housing. Washers 26 and 27 surrounding the shaft 23 are secured to the housing 14 outwardly of the ball bearing units 24 and 25 respectively. A rubber tired, large traction driving wheel 28 is rigidly secured on the right end of the shaft 23 as viewed in Figure 3. A worm gear 29, loosely mounted on the shaft 23, engages with the worm shaft 15 and acts to drive the same when driven forwardly, as will be hereinafter described.

The gear 29 is driven from the shaft 23 by means of a suitable one-way, ball clutch comprising the annular member 30, the periphery of which is recessed to provide inwardly sloping tracks 31 distributed about said periphery. A ball bearing 32 is mounted in each recess 31 and is adapted, when the member 30 is rotated forwardly, to move outwardly in said recess and frictionally engage an annular ring 33 integrally secured to the gear 29. A pair of rearwardly extending lugs 34 are positioned transversely on either side of the plate 12 and have pivotally mounted therein the lower forked end of a usual guiding handle 35. A semi-cylindrically shaped cover 36 removably engages over the upper side of the housing 14 for closing said housing.

It will be apparent that the foregoing device is highly economical in that by being mechanically driven it saves electricity, or the like, which would otherwise be necessary to drive the fan and the rotatable brush.

Due to the triangular support embracing the transversely spaced wheels 8 and the centrally positioned rear wheel 28 which also drives the fan, the device may be conveniently operated and guided. By providing a one-way clutch, the shaft 15, which is adapted to be driven by the gear 29 in only one direction, will not prevent rotation of the wheel 28 in any direction.

The gear 29 is designed to drive the shaft 15 at a very high rate of speed. The shaft 9, being driven directly from the wheels 8, is not subject to become tangled by foreign objects such as hair or string and the like.

The operation of the device to those skilled in the art will be obvious from the foregoing description.

I am aware that many changes may be made, and numerous details of construction may be varied through a wide range without departing from the principles of this invention, and I therefore do not purpose limiting the patent granted hereon, otherwise than necessitated by the prior art.

I claim as my invention:—

1. In a device of the character described, a wheeled casing, a fan journalled in said casing, a drive shaft for said fan, a gear on said shaft having an annular integral ring, a one-way clutch element within said ring, and a single traction wheel operatively connected to said fan by said clutch element.

2. In a device of the character described, a casing having a mouth, a cylindrical housing communicating with said mouth, a fan rotatively mounted in said housing, said housing terminating in a centrally disposed elongated extension, a shaft journalled in said extension normal to the axis of rotation of said fan, a gear loosely mounted on said shaft within said extension, said gear being operatively connected to said fan, a one-way clutch associated with said gear, and a single traction wheel fixed to said shaft to drive said fan.

3. The combination with a wheeled casing, a fan journalled in said casing, a shaft in said casing disposed normal to the axis of rotation of said shaft, a gear loosely mounted on said shaft within said casing, said gear being operatively connected to said fan, a one-way clutch associated with said gear and shaft, and a single traction wheel fixed to the end of said shaft exterior of said casing to drive said fan.

In testimony whereof I have hereunto subscribed my name.

FRANK G. LINDGREN.