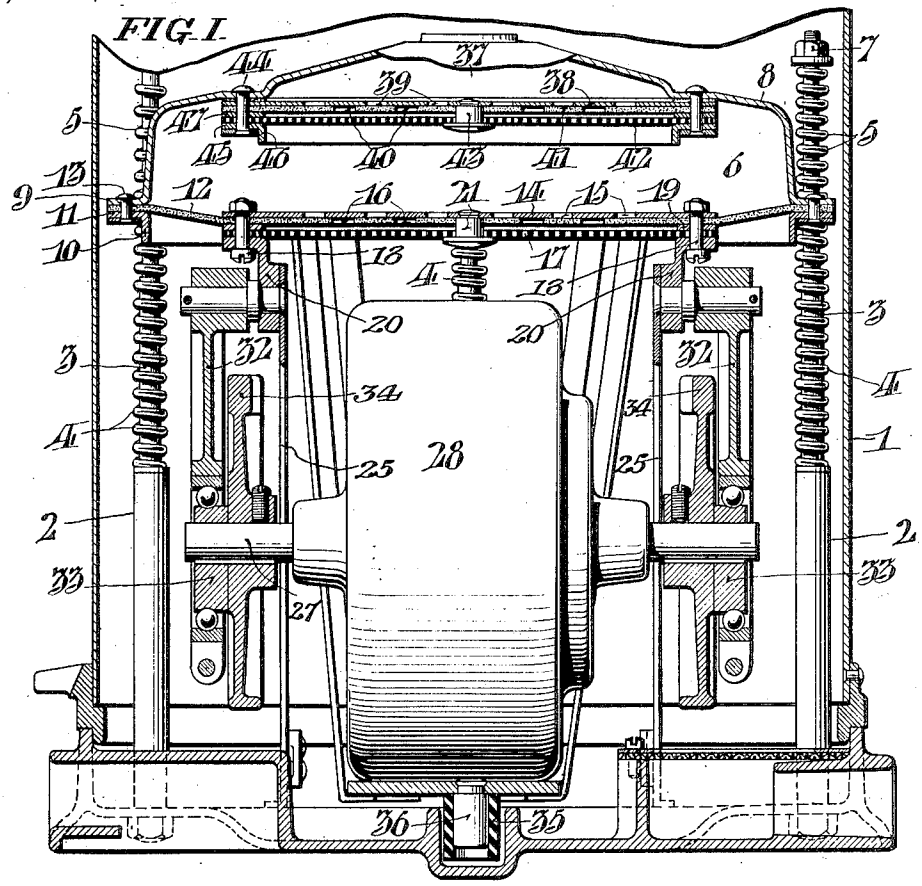
T. WIEDEMANN & J. H. TEMPLIN.

PUMPING APPARATUS.

APPLICATION FILED JAN. 5, 1912.

1,206,631. Patented Nov. 28, 1916.

FIG. I.



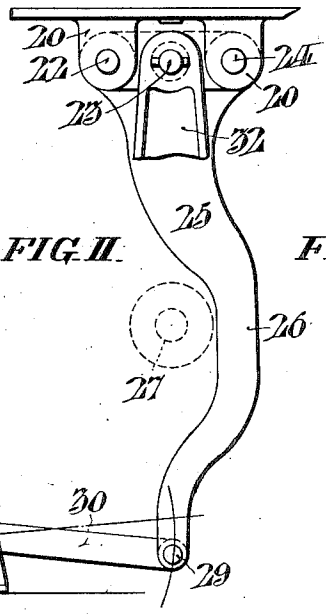


FIG. II.

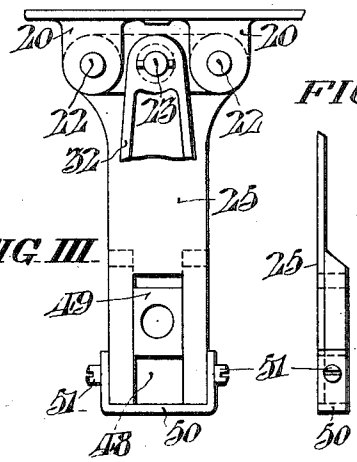


FIG. III.

FIG. IV.

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UNITED STATES PATENT OFFICE.

THEODORE WIEDEMANN AND JOSEPH H. TEMPLIN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNORS, BY MESNE ASSIGNMENTS, TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

PUMPING APPARATUS.

1,206,631. Specification of Letters Patent. Patented Nov. 28, 1916.

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To all whom it may concern:

Be it known that we, THEODORE WIEDEMANN and JOSEPH H. TEMPLIN, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Pumping Apparatus, whereof the following is a specification, reference being had to the accompanying drawings.

The invention relates to a pumping apparatus for a vacuum cleaner, and more especially to the actuating means for the reciprocating diaphragm of the pump.

An object of the invention is to provide devices for guiding the pumping member during its reciprocation, whereby the same is caused to travel in a longitudinal path, which guiding means also limits and controls the oscillations of said pumping member.

In the accompanying drawings which show by way of illustration one embodiment of the invention, Figure I, is a sectional elevation of a pumping mechanism embodying my invention. Fig. II, is a side elevation of my improved guiding member for the reciprocating diaphragm. Fig. III, is a similar view, showing a modified form of the invention. Fig. IV, is a side view of a part of the construction shown in Fig. III.

The invention as herein illustrated, is shown as applied to a well known type of pumping apparatus, employed for vacuum cleaning purposes. Said apparatus consists of a casing 1, having a supporting base to which is secured any desired number of standards 2, having the upper portions thereof of a reduced diameter, as indicated at 3. Located on the reduced part of the standards 2, are springs 4, and 5, between which is interposed the casing of the pump 6. Threaded on the upper ends of the standards are nuts 7, and the springs 5, bear against said nuts. By this construction, the pump 6, is resiliently supported. The pump 6, comprising an upper casing 8, having a flange 9, an annulus 10, provided with a flange 11, and a flexible reciprocating pumping member or diaphragm 12, the outer periphery of which is secured between the flanges 9, and 11, by suitable fastening devices 13. The diaphragm 12, is formed with apertures 16, and a plate 14, having apertures 15, staggered relative to the apertures 16, is secured to the under side of said diaphragm 12. The movement of the flexible diaphragm is limited by an apertured member 17, which member is secured in position by the fastening devices 18. The fastening devices 18, pass through the plate 14, diaphragm 12, and the washer 19, and are secured to the brackets or hangers 20. The central portions of the valve members and the member 17, are held in proper relation to each other by a central fastening device 21.

The brackets or hangers 20, are provided with pins 22, 23, and 24, which pins 22, and 24, pass through the guide member 25, whereby said guide member is held non-rotatable with respect to the hangers 20. The guide member 25, is deflected outwardly and downwardly, as indicated at 26, whereby the same is capable of a vertically reciprocating movement, without striking the motor shaft 27, which is operated by the motor 28. The lower end of the guide member 25, is deflected inwardly and downwardly, and is pivotally connected at 29, to one end of the link 30. Said link 30, is pivoted at 31, to a suitable fixed bracket carried by the base of the casing 1. A connecting rod 32, coöperates with a suitable eccentric 33, on the motor shaft 27, and is pivoted at its upper end to a pin 23.

In the drawings, we have shown the pumping member as actuated by two connecting rods, but it will be understood that from certain aspects of the invention, a single connecting rod might be used. We have also shown the motor shaft as provided with suitable balance wheels 34. The base of the motor is provided with an extension 36, which carries a buffer 35, and this buffer cooperates with the walls of a recess in the base of the cleaner, to prevent any material vibration of the pump on its supporting mechanism.

The pump 6, is provided with an inlet 37, which is controlled by a suitable valve which as herein shown, consists of a metal plate 38, having apertures 39, which are in staggered relation with respect to the apertures 40, in a flexible valve member 41. A screen or apertured member 42, will prevent improper movements of the valve member, while a central fastening device 43, will prevent sidewise or improper movement of the

members 40, 41, and 42. This valve mechanism is secured to the pump casing by fastening devices 44, which pass through an annulus 45, having a flange 46. Washers 47, are interposed between the valve member 41, and the screen 42, in order to provide for the requisite amount of movement of the flexible valve member 41.

In the embodiment of the invention as shown in Figs. III, and IV, the guiding member is not deflected as in the construction shown in Figs. I, and II, but is formed with a slot 48, through which the motor shaft extends. Located in the slot 48, is a journal box 49, which surrounds the shaft and this journal box engages the side edges of the slot. The lower end of the slot is closed by a strap 50, secured to the guiding member by suitable screws 51.

In the operation of the device, the motor 28, is actuated by any suitable source of current, and the rotation of the shaft 27, will cause the connecting rods 32, to reciprocate and thus vibrate the pumping member or diaphragm. The operation of the valves in the pumping member and also the valve mechanism controlling the inlet to the pump, is obvious. Owing to the guiding rod 26, and the manner in which it is secured to the hangers 30, the follower head or pumping member, instead of having imparted thereto a combined oscillatory and reciprocatory movement, will be reciprocated bodily laterally. The pivotal point 29, of the guiding member 25, travels in an arc which is of little curvature, and which extends substantially vertically. In other words, the rigid connection between the guiding member 25, and the pumping member, will cause the pumping member to move bodily laterally, with little or no oscillation, and the pivotal connection between the connecting rods and the hangers allows this bodily lateral movement.

In the construction shown in Figs. III, and IV, the guiding member through its sliding connection with the journal box surrounding the shaft, will also cause the pumping member to move bodily laterally, without oscillation.

While we have shown and described in detail a pumping mechanism and actuating means therefor, it will be understood that the invention in its broadest aspect, is not limited to the specific mechanism herein shown, but that our improved guiding means for the pumping member, may be applied to various types of pumping mechanism, and actuating devices therefor.

Having thus described our invention, we claim:—

1. A vacuum cleaner including in combination, a diaphragm pumping member having a valve located centrally thereof; hangers secured to the diaphragm; means for engaging the hangers for reciprocating the diaphragm; guiding members connected to said hangers; and means coöperating with the guiding members for preventing oscillations of the hangers.

2. A vacuum cleaner including in combination, a diaphragm pumping member having a valve located centrally thereof; hangers connected to said diaphragm; guiding members secured to the hangers; connecting rods pivotally connected to the hangers; means for operating the connecting rods for reciprocating the diaphragm; guiding members connected with the hangers; and means coöperating with the guiding members for causing the hangers in the central portion of the diaphragm to move bodily laterally, without oscillation.

3. A vacuum cleaner including in combination, a pumping member having a central bodily moving portion; hangers connected therewith; connecting rods pivoted to said hangers; means for actuating the connecting rods; guiding members rigidly connected to the hangers; and devices coöperating with the guiding members for causing said central portion to move bodily laterally, without oscillation.

In testimony whereof, we have hereunto signed our names at Philadelphia, Pennsylvania, this third day of January, 1912.

THEODORE WIEDEMANN.
JOSEPH H. TEMPLIN.

Witnesses:
JAMES H. BELL,
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