M. DENNIS.

SUCTION CLEANER.

APPLICATION FILED AUG. 26, 1914.

1,129,174.

Patented Feb. 23, 1915.

2 SHEETS—SHEET 1.

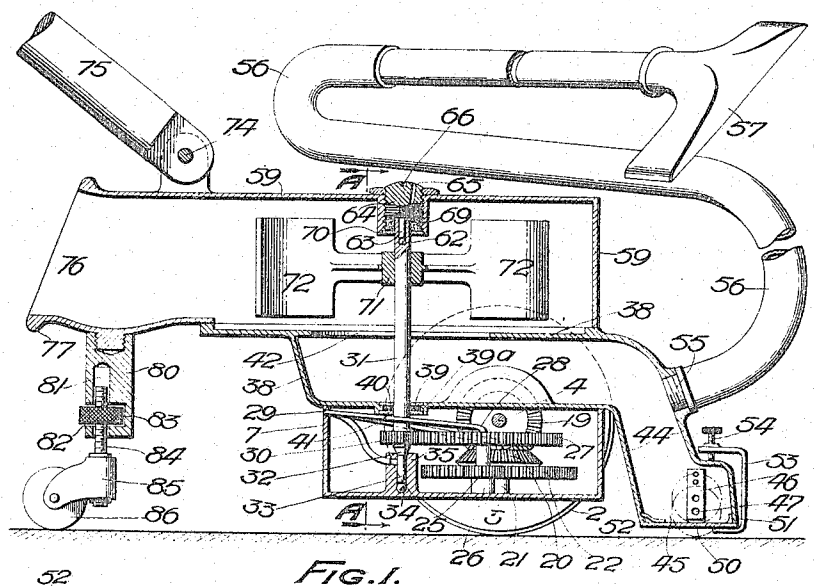


FIG. 1.

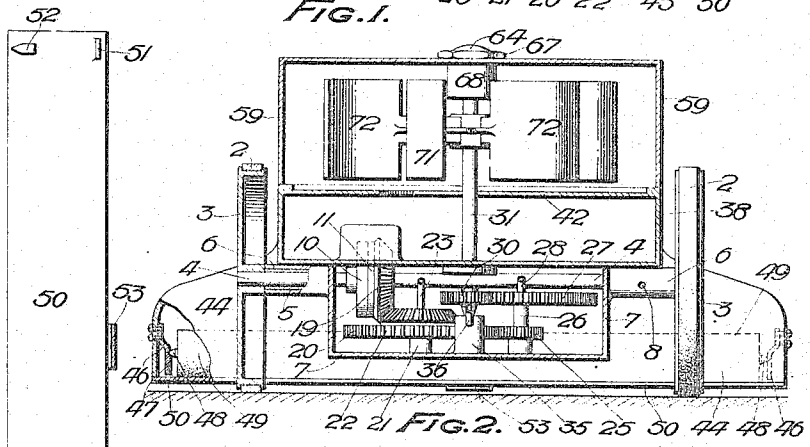


FIG. 2.

FIG. 3.

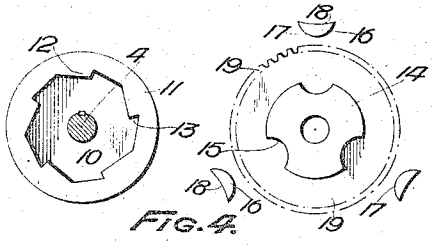


FIG. 4.

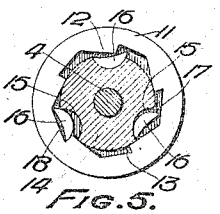


FIG. 5.

Witnesses.

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2 SHEETS—SHEET 2.

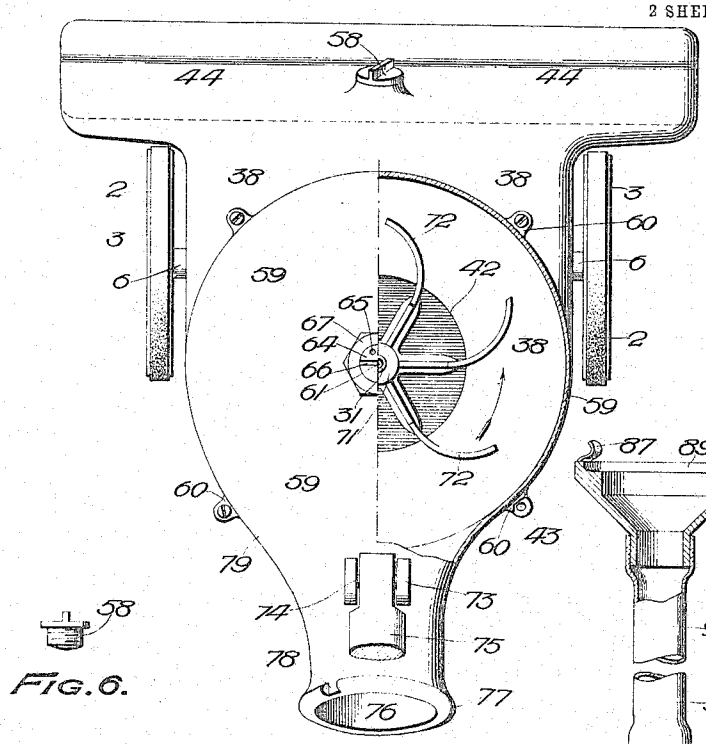


FIG. 6.

FIG. 7.

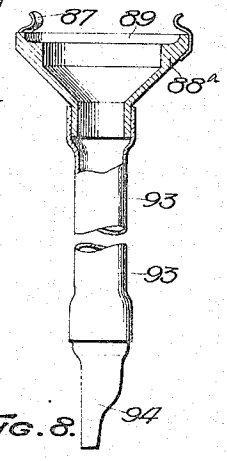


FIG. 8.

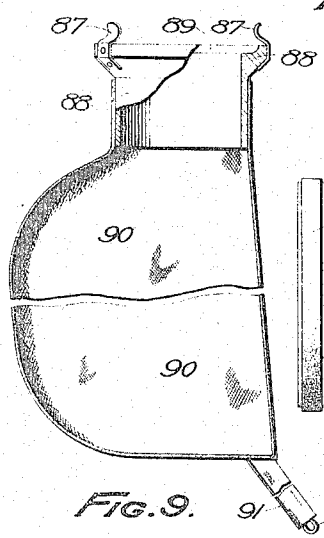


FIG. 9.

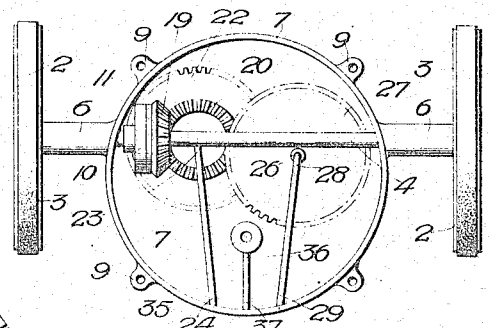


FIG. 10.

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SUCTION-CLEANER.

1,129,174. Specification of Letters Patent. Patented Feb. 23, 1915.

Application filed August 26, 1914. Serial No. 858,662.

To all whom it may concern:

Be it known that I, MATILDA DENNIS, a subject of the King of Great Britain and Ireland, and a resident of the post-town of Clifton Hill, a district of the city of Collingwood, a suburb of the city of Melbourne, in the county of Bourke, State of Victoria, Commonwealth of Australia, whose post-office address is 21 North Terrace, in the said post-town of Clifton Hill, but previously a resident of 1237 Hancock street, in the borough of Brooklyn, in the city of New York, county of Kings, in the State of New York, United States of America, have invented certain new and useful Improvements in Suction-Cleaners, of which the following is a specification.

This invention relates to domestic suction cleaning apparatus of the kind wherein a fan is adapted to draw dust and the like into the said cleaner and deliver the said dust into a receiving bag. Suction cleaners of this type are generally employed for removing dust and the like from floors but are often provided with a detachable hose pipe whereby the walls of a room may be cleansed and are also, further, provided with a detachable blowing hose whereby dirt collections in inaccessible positions, corners and the like are dislodged.

The object of this invention is to provide a cheap, simple, and highly efficient suction cleaner of the type indicated wherein lubrication of the various moving elements is thoroughly effected, wear is reduced, the construction simplified, the cost of manufacture reduced, and the several moving elements rendered lighter in operation thereby decreasing the draft. The parts may be easily and quickly inspected or renewed when necessary.

The invention consists in the combination of parts hereafter pointed out in the appended claims.

Referring to the drawings which form a part of this specification. Figure 1 is a longitudinal section of a suction cleaner according to this invention, a closing plate and a suction hose being shown in position and a receiving bag and a rotary brush being removed for convenience of illustration. Fig. 2 is a sectional end view looking in the direction of the arrow, Fig. 1, the plane of section being indicated by line A—A. A rotary brush is shown in position. Fig. 3 is a plan of a closing plate. Fig. 4 is a view of a one-way clutch or free-wheel device the elements of which are separated or opened apart for convenience of illustration. Fig. 5 is a view of the clutch or free wheel device showing the parts in their correct relative positions. Fig. 6 is a view of a plug for closing an air inlet hole when the suction hose is not employed. Fig. 7 is a part sectional plan of this invention, the receiving bag, suction hose, and closing plate being removed for convenience of illustration. The plug seen in Fig. 6 is in position. Fig. 8 is a part sectional view of a blowing hose for attachment to the cleaner (in lieu of the receiving bag) when it is desired to dislodge dust or the like. Fig. 9 is a sectional view of a receiving bag for attachment to the cleaner to receive dust and the like. Fig. 10 is a plan of a lower casing and driving gear therein.

The invention includes two rubber or other tires 2 encircling grooved supporting wheels 3. Each wheel 3 is secured to the end of a live axle 4 mounted in bushes 5 carried by bearings 6 integral with a lower casing 7. Formed in the bearings 6 and bushes 5 are oil holes 8. Protruding from the lower casing 7 are lugs 9 having therein threaded or other holes.

Secured to one end of the live axle 4, within the lower casing 7, is a first clutch member consisting of a disk 10 carrying a ring 11 having a series of inwardly projecting teeth 12 adjacent each of which is a recess 13. Within the ring 11 is a second clutch member 14 having therein a series of part circular pockets 15 accommodated in each of which is a free pawl 16 having a rounded inner surface 17 and a slightly concaved outer surface 18. Integral with the second clutch member 14 is a first bevel wheel 19. The first clutch member is secured to the axle 4. The second clutch member and the first bevel wheel are free upon the said axle.

Engaging the first bevel wheel 19 is a second bevel wheel 20 mounted upon a first stud 21 upstanding from the bottom of the casing 7. Secured to the second bevel wheel 20 is a first toothed wheel 22. Passing from the first stud 21, above the second bevel wheel 20, is the inner end 23 of a first oil pipe, the outer end 24 of which passes to the wall of the lower casing 7. Engaging the first toothed wheel 22 is a first toothed pinion 25 mounted upon a second stud 26 and rotating a second toothed wheel 27. Pass-

ing from the second stud 26, above the second toothed wheel 27, is the inner end 28 of a second oil pipe the outer end 29 of which opens through the wall of the lower casing 7.

Engaging the second toothed wheel 27 is a second toothed pinion 30 mounted upon the lower end of a vertical spindle 31. Formed upon the vertical spindle 31 is a cone 32 below which is a reduced portion 33. The reduced portion or extremity 33 of the vertical spindle 31 rests upon a ball 34 located in a bearing 35 upstands from the bottom of the casing 7. Passing from the bearing 35 is the inner end 36 of a third oil pipe, the outer end 37 of which opens through the wall of the said casing 7.

Secured to the lower casing 7 by screws or the like passing through the lugs 9 is an intermediate casing 38. Carried by the intermediate casing 38 is an upper plate 39 below which is a collar 39^a encircling a layer of felt 40 or the like retained within the collar by a lower plate 41. Formed through the plates 39 and 41 and the felt 40 is a spindle hole through which passes a vertical spindle 31 the felt preventing dust passing from the intermediate to the lower casing, as will be hereinafter more fully understood. Formed in the intermediate casing is a suction hole 42 through which the vertical spindle 31 passes. Protruding from the intermediate casing are lugs 43 having therein threaded or other holes. The intermediate casing 38 is provided with a laterally elongated depending front portion 44 having a mouth or entrance 45. Within and secured at each end of the front portion 44 is an in-bent plate spring 46 having therein a plurality of bearing holes 47. Extending between the plate springs 46 is a spindle 48 mounted upon which is a suitable rotary brush 49. The distance the brush 49 protrudes through the entrance 45 may be regulated or adjusted by reason of the bearing holes 47.

With the intermediate casing is used a closing plate 50 having at each of its ends an upstanding lug 51 and an uplifted catch finger 52. Passing from the closing plate 50 is a retaining strap 53 carrying a holding screw 54. The catch fingers 52 pass into suitable pockets formed in the front portion 44. The holding screw 54 pressing upon the said front portion as shown.

Formed in the depending front portion 44 is a threaded inlet hole. Engaging in the threaded hole is a threaded removable nipple 55 carried by the inner end of a suction hose 56 the outer end of which is provided with a suitable nozzle 57. When it is desired to dispense with the use of the suction hose 56 a removable threaded plug 58 is placed in the threaded hole in lieu of the nipple 55.

Secured to the lugs 43 and resting upon the intermediate casing 38 is an upper casing 59 having lugs 60. The upper end of the vertical spindle 31 projects into the upper casing 59. Formed in the upper end of the said spindle is a stem chamber 61 containing a ball 62 resting on which is the lower end of a stem 63 the upper end of which is integral with a threaded plug 64 having therein an oil hole 65 and a transverse groove 66. Threaded upon the plug 64 is a lock nut 67 bearing upon the top of the upper casing 59. The plug 64 is threaded into a boss 68 depending from and into the said casing 59. Formed in the lower end of the boss is a chamber accommodating a layer of felt packing 69 retained in position by a closing plate 70.

Secured to the upper end of the spindle 31 within the upper casing 59 is the boss 71 of a fan comprising a series of curved blades 72. The number of blades, their conformation and area may vary.

Upstanding from the upper casing are two lugs 73 between which extends a cross pin 74. Pivoted to the cross pin is the inner end of a handle 75. Projecting from the casing 59 adjacent the lugs 73 is a delivery neck 76 having a flange 77 formed in which is a passageway 78. The junction of the casing with the delivery neck 76 at the right hand side may be comparatively sharp and is immaterial. At the left hand side, however, the casing is enlarged or out-bent as at 79.

Threaded or otherwise secured to the upper casing 59 below the delivery neck 76 thereof, is a depending stud 80 having therein a plain hole indicated at 81 and a mouth indicated at 82. Disposed in the mouth 82 is a finger nut 83 passing through which is a threaded shank 84 loosely or pivotally secured at its lower end to a forked carrier 85 in which is mounted a caster wheel 86.

Engaging the flange 77 of the delivery neck 76 are fingers 87 protruding from a collar 88 having an instep 89 bearing against the said flange 77. Secured to the collar 88 is the inner end of a receiving bag 90 the outer end of which may be provided with an exhaust flap or door, not shown, retained closed by a clip of any desired character. Or the outer end may be permanently closed, as shown in Fig. 9. Secured to the outer end of the receiving bag 90 is the inner end of a supporting strap 91, the outer end of which is provided with an eye 92 engaging a hook or the like (not shown) carried by the handle 75.

When it is desired to dispense with the receiving bag and employ the apparatus as a blower a collar 88^a is employed to engage the flange 77 of the delivery neck as already described. Carried by the collar, however, is the inner end of a blowing hose 93 the outer end of which is provided with a suit

able nozzle 94. The receiving bag 90 and blowing hose 93 may be interchangeable for use with the same collar 88 or each may be provided with its own collar.

This invention is operated as follows:— Presuming that it is desired to remove dust from a floor the closing plate 50 is removed, if in position, as also is the suction hose 56, the removable plug 58 being substituted for the said hose. The receiving bag 90 is placed in position upon the delivery neck 76. The distance between the floor and the mouth or entrance 45 of the intermediate casing 38 may be adjusted by rotating the finger nut 83 and elevating or lowering the delivery end of the apparatus. The apparatus by means of the handle 75 is pushed forwardly the supporting wheels 3 thereby rotating. The brush 49 engages the floor surface. As the wheels 3 rotate, the axle 4 rotates the first clutch member 10, 11, one of the free pawls 16 engaging the teeth 12 of the said member and thereby driving the second clutch member 14 and the first bevel wheel 19. When the apparatus is drawn toward the operator the free pawls 16 bear against the teeth 12 and pass the recesses 13 pivoting or rocking in the pockets 15. By this means the fan blades 72 rotate continuously in one direction only. The first bevel wheel 19 rotates the second bevel wheel 20, toothed wheel 22, first toothed pinion 25, second toothed wheel 27 and second toothed pinion 30. The second toothed pinion 30 rotates the vertical spindle 31 and with it the fan blades 72. It will be observed that the lower end of the spindle 31 turns upon the ball 4 and that its upper end is provided with a ball 62 upon which rests the stem 63 of the threaded plug 64. It will be also observed that all of these parts are capable of being freely and efficiently oiled. As the fan rotates it induces a draft through the mouth 45 of the front portion 44 of the intermediate casing 38. Dust and the like is thereby drawn into the intermediate casing passing through the suction hole 42 into the upper casing 59. It is then delivered by reason of the fan through the delivery neck 76 of the said upper casing and enters into the receiving bag 90.

Should it be desired to remove dust and the like from the walls of a room, for example, the brush 49 may be removed. This may be effected by pressing its spindle 48 in either direction thereby compressing one of the plate springs 46. Or the said brush may remain in position above the mouth 45 of the intermediate casing 38. The closing plate 50 is now placed in position. This is effected by engaging the fingers 52 with pockets formed in the interior of the mouth 45 and retaining the said plate by means of the holding screw 54. The bristles of the brush, if it remains in operative position, are simply bent by the plate. The mouth 45 is now closed. The plug 58 is removed and the suction hose 56 substituted therefor. Upon the apparatus being operated the fan causes a suction through the nozzle 57 and the hose 56, the dust being delivered into the receiving bag 90.

Should it be desired to use the apparatus for blowing, the closing plate 50 may be removed and the plug 58 substituted for the suction hose 56. Or the hose may, in some instances, remain in position as also may the closing plate. The receiving bag 90 is removed by turning its collar 88 until one of the fingers 87 passes through the passage 78 of the flange of the delivery neck 76. The blowing hose 93 is now substituted for the receiving bag and, as the apparatus is moved forwardly, the fan causes a current of air to pass through the said hose.

It is to be understood that the invention is not limited to the gearing described, as other gears may be used if desired and be formed of fiber or the like to eliminate noise. Further, the nipple of the suction hose and the plug used, when the said hose is not required, need not be threaded but may be retained to the front portion of the intermediate casing in any other suitable way. Still further, instead of employing a finger nut and threaded shank to adjust the height of the delivery end of the apparatus other suitable devices may be used. Any such modifications are considered to be within the spirit and scope of the invention.

Having now described my invention what I claim as new and desire to secure by Letters Patent is:—

1. Improvements in suction cleaners, consisting in the combination with supporting wheels, of a lower casing, a live axle mounted therein and secured to the supporting wheels, a clutch device mounted upon the axle within the casing, an intermediate casing above the lower casing, said intermediate casing having a laterally elongated depending front portion provided with a mouth, an upper casing above the intermediate casing, a fan within the upper casing, means for rotating the fan by the clutch device when the supporting wheels rotate in one direction, a delivery neck passing from the upper casing, a handle pivoted to the said upper casing, and means carried by the upper casing for vertically adjusting the delivery end thereof.

2. In a suction cleaner, the combination of a lower casing, a live axle mounted therein, supporting wheels on the axle, a clutch device mounted upon the axle within the casing, a vertical spindle supported in the said casing, means for rotating the spindle by the clutch device when the supporting wheels rotate in one direction, an intermediate casing provided with a depending front

portion having a mouth, an upper casing into which the spindle projects, a fan on the spindle in the upper casing, and a delivery neck projecting from the upper casing.

3. In a suction cleaner, the combination of a lower casing, a live axle mounted therein, supporting wheels secured to the axle, a clutch member secured to the live axle within the lower casing, a second clutch member loosely mounted upon the axle, a driving wheel carried by the second clutch member, a vertical spindle supported in the said casing, means for rotating the spindle by the driving wheel when the supporting wheels rotate in one direction, an intermediate casing having a depending front portion provided with a mouth, an upper casing into which the spindle projects, and a fan secured to said spindle within the upper casing.

4. In a suction cleaner, the combination of a lower casing, a live axle mounted therein, supporting wheels secured to the axle, a clutch device mounted upon the axle within the casing, a vertical spindle mounted in said casing, means for rotating the spindle by the clutch device when the axle turns in one direction, an intermediate casing having a depending front portion provided with a mouth, a spindle extending across the mouth, a brush mounted upon the spindle, an upper casing into which the vertical spindle extends, a fan secured to the spindle within the upper casing, and a receiving bag attached to the upper casing.

5. In a suction cleaner, the combination of a lower casing, a live axle mounted therein, supporting wheels secured to the axle, a clutch device mounted upon the axle within the casing, a vertical spindle in the casing, means for rotating the spindle by the clutch device when the supporting wheels rotate in one direction, an intermediate casing having an elongated front portion provided with a mouth, an upper casing into which the spindle extends, a fan secured to the spindle within the upper casing, and a receiving bag attached to the upper casing.

6. In a suction cleaner, the combination of supporting wheels, a live axle extending therebetween, a lower casing supported by the live axle, a first clutch member secured to the live axle within the lower casing, a second clutch member loosely mounted upon the axle, a driving wheel carried by the second clutch member, gear wheels operated by said driving wheel, a vertical spindle rotated by said gear wheels, an intermediate casing having an enlarged depending front provided with a mouth, a brush mounted in said mouth, an upper casing, a fan secured to the spindle within the upper casing, and a receiving bag secured to the said upper casing.

7. In a suction cleaner, the combination of supporting wheels, a live axle extending therebetween, a lower casing carried by the axle, a first clutch member secured to the axle, a second clutch member free upon the axle, a driving wheel carried by the second clutch member, gear wheels operated by the driving wheel, a vertical spindle operated by the gear wheels, an intermediate casing having an elongated depending front portion provided with a mouth, an upper casing carried by the intermediate casing and having a delivery neck said spindle extending into said upper casing, a fan carried by the spindle within the upper casing, and a receiving bag secured to said neck.

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses.

MATILDA DENNIS.

Witnesses:
W. J. SLASTRIER,
GEORGE A. MCREN.