G. BACKER.

VACUUM CLEANER.

APPLICATION FILED FEB. 19, 1910.

969,441.

Patented Sept. 6, 1910.

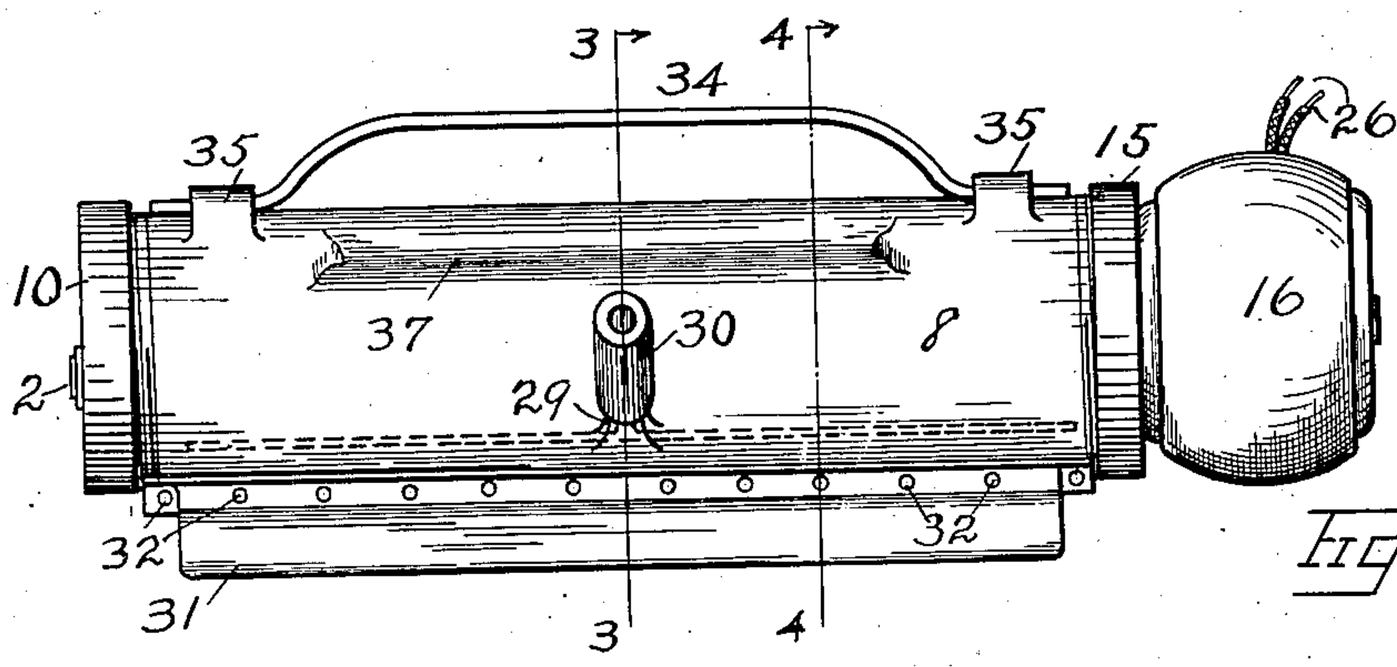

Fig. 1.

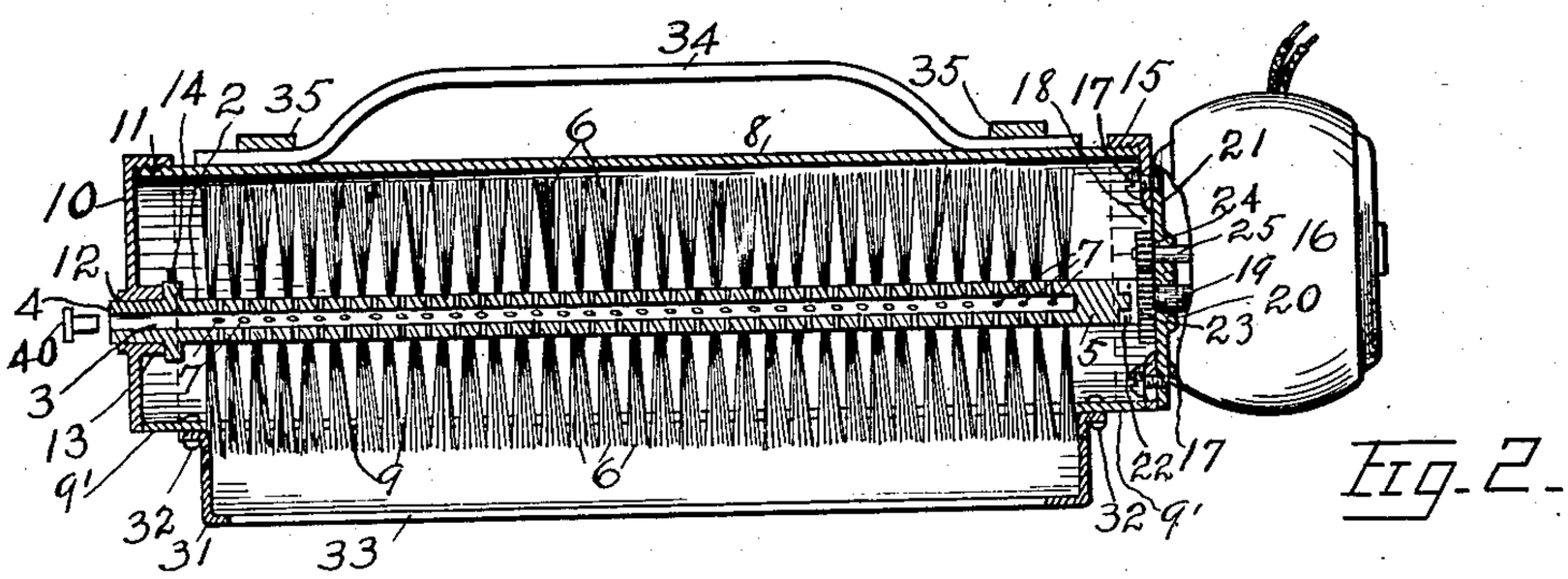

Fig. 2.

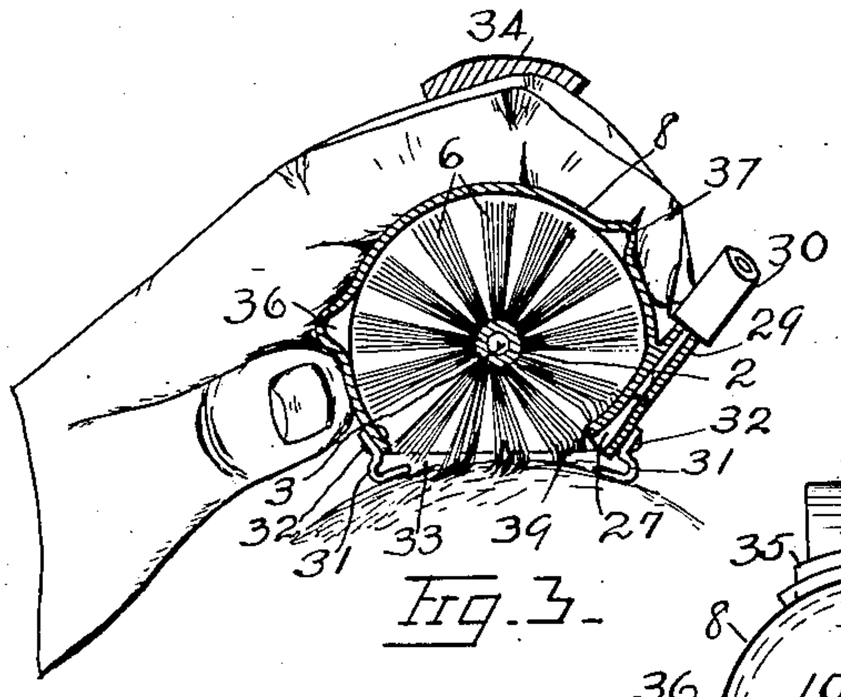

Fig. 3.

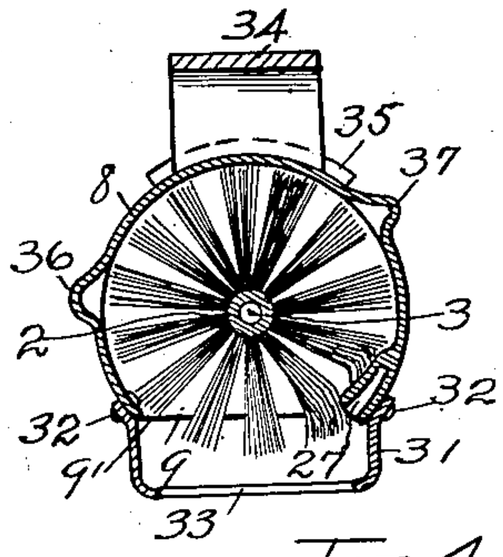

Fig. 4.

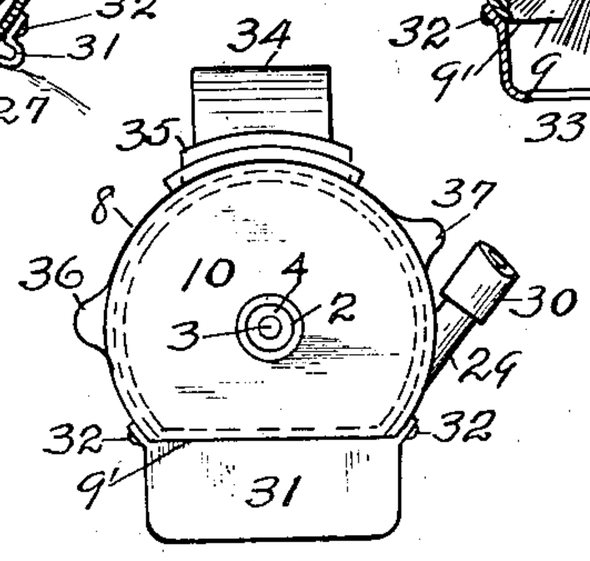

Fig. 5.

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VACUUM-CLEANER.

969,441.

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Application filed February 19, 1910. Serial No. 544,771.

To all whom it may concern:

Be it known that I, GEORGE BACKER, a citizen of the United States, residing at Syracuse, in the county of Onondaga and State of New York, have invented certain new and useful Improvements in Vacuum-Cleaners, of which the following is a specification.

This invention relates to improvements in brushes, designed for use in cleaning, scrubbing and scouring, and the invention relates particularly to a power driven brush for cleaning animals, such as horses, cattle and the like.

The object of the invention is to provide a brush for cleaning purposes, arranged to be driven directly by a motor of any suitable make, the brush preferably inclosed in a casing or shell in close proximity to the motor and easily portable.

A further object is to provide a brush of the class arranged for use in connection with a vacuum producing device, whereby all dust or dirt loosened and picked up or gathered by the brush when passed over a surface or body may be readily drawn away from the brush and discharged at a distant point.

A further object of the invention is to provide means for preserving the suction or vacuum at the point of contact between the brush and the article to be cleaned. And a further object is to provide means for regulating—increasing or diminishing, the force or degree of the vacuum, and also the speed of the brush.

Other features and parts of the invention will be understood from the detail description which follows and by reference to the accompanying drawing forming a part of this specification, and in which—

Figure 1 is a side elevation of the complete device with motor attached. Fig. 2 is a central longitudinal section through the casing and brush showing the construction and arrangement of the parts. Fig. 3 is a vertical cross-section on line 3—3 of Fig. 1. Fig. 4 is a similar view taken on line 4—4 of Fig. 1. Fig. 5 is an end elevation.

Similar characters of reference are assigned to corresponding parts throughout the several views.

The object of the present invention is to provide a light and compact power cleaning device, of the pneumatic type, particularly adapted for cleaning horses and other animals, to take the place of the common curry comb and brush, wherein a rotary brush is employed for loosening and detaching dandruff and dirt, the latter being removed by suction produced by a vacuum device preferably located at a distance from the object to be cleaned.

In the drawing, 2 represents the elongated shaft-like body of the brush, which is shown bored out for a greater part of its length, as at 3, and having one open end, as 4, the other end being solid and closed, as at 5.

6 represents the bristles of the brush, which may be secured to the body or shaft 2 by any suitable means. The bristles are preferably arranged to radiate from the shaft, in a manner to form a cylindrical brush, as shown in Figs. 2, 3 and 4.

7 represents a series of perforations arranged in the shaft and connecting with the hollow interior. These perforations are intended for vents for the inlet of air for the purpose of keeping the bristles clean while the brush is in use, as well as for reducing the vacuum when necessary for any purpose.

8 represents cylindrical hollow casing or hood for inclosing the brush, which is preferably made of light material, such as sheet metal, having open ends and an elongated slot or opening 9 in the bottom. The opening 9 extends to within a short distance of each of the ends, and the portions of the bottom adjacent the ends of the opening 9 are preferably flattened as indicated by the line 9′ in Fig. 5.

10 represents a flanged cap for closing one end of the casing, the flange being threaded for securing the cap to the threaded portion 11 of the casing. The flange of this cap extends the full distance of the curved portion of the cap corresponding to the like arrangement of the cylinder 8, the lower portion of the cap being formed with a horizontal edge coinciding with the flat portion 9′ of the casing. The cap 10 is perforated near its center, as at 12, and provided with an inwardly projecting sleeve 13, which serves as a bearing for the outer end of shaft 2, the latter having an annular flange or shoulder 14 which engages the sleeve to prevent endwise movement of the shaft. 15 represents a similar cap which is fitted to the opposite open end of the hood 8 by threads in the same manner as cap 10.

16 represents an electric motor casing which is connected to the cap 15 by screws or bolts 17. In practice the motor casing may be applied to the cap before the latter is attached to the hood.

The cap 15 is perforated centrally, as at 18, to permit of connecting the brush shaft 2 with the driving mechanism operated by the motor (not shown) within the casing 16.

The motor employed for operating my brush may be of any suitable construction or make, and may be mounted in its casing in the usual manner. The brush is operated by a drive-mechanism consisting of a shaft 19 which is mounted in a bearing 20 arranged in the inner end wall 21 of the motor casing 16. The connection between the shaft 2 and the shaft 19 being effected by means of a clutch 22 which may follow any of the well-known clutch constructions. Upon the shaft 19 is mounted rigidly a spur-gear 23, which is arranged to mesh with a pinion 24 carried by the motor shaft 25 by which the brush is driven, the shaft 25 having its bearing in the wall 21 of the motor casing. The motor is supplied with electric current by wires 26. The bottom of the hood 8 is open at 9, as shown in Figs. 2, 3 and 4 and the bristles of the brush normally project below the level of the bottom of the hood into the opening 9. Along one side of the opening 9 the hood 8 is provided with a recess or socket 27 arranged with its open mouth facing the opening 9, as shown in Figs. 3 and 4. This recess is formed between two spaced layers or walls of the metal comprising the hood.

The recess or slot 27 above mentioned forms an exhaust passage in the casing 8 and extending practically the entire length of the brush. Furthermore, this passage 27, which virtually constitutes a dirt outlet, is located so that it does not communicate with the interior of the casing 8 except at its receiving edge where the bristles of the brush engage. The dirt outlet passage thus carries off the dirt, dandruff or foreign matter removed by the machine so that such material does not come into contact with any of the interior working parts of the machine which is disadvantageous because the latter would in time become clogged by the dirt and the operation of the device seriously interfered with.

At a point near the middle of the hood a sleeve or tubular part 29 connects with the socket 27, to the outer end of which is connected a pipe or hose 30 which may lead to and connect with a suitable vacuum or suction device preferably located at a distance from the brush. The pipe 30 should be flexible so as to permit of the free manipulation of the brush during the cleaning operation. The pipe 30 is employed for carrying away the fine particles of dandruff or dirt loosened up or gathered by the brush and which may be discharged in any suitable manner.

In order to afford a proper seal between the brush-hood 8 and the body or surface to be cleaned, the opening 9 of the hood is skirted all around by a flexible rubber apron or part 31, which is made fast to the lower edges of the hood, as by rivets or screws 32. The apron, at the point where it joins the hood, should be secured to the latter in a manner to afford as nearly as possible an air tight joint, so as to prevent loss of vacuum at this point. The rubber apron 31 is provided with an opening 33 in its bottom coinciding with the opening 9 of the hood.

The construction and arrangement of my cleaning device is such that the user thereof may readily apply and operate the same with but one hand, with about the same facility as he now operates other forms of hand-brushes. In manipulating the brush for cleaning purposes the operator grips the hood with one hand, as illustrated in Fig. 3, and in doing so he passes his fingers beneath a strap 34, which is secured to the top of the hood by means of lugs 35. In order to enable the operator to grip and properly handle the device, the hood is preferably provided with oppositely arranged outwardly facing ribs 36 and 37. In applying the device to a surface or a body to be cleaned, the operator should press the brush against the object with sufficient force to crush the rubber apron 31 in the manner shown in Fig. 3. By this operation the depending edges of the apron are all brought to a firm bearing upon the surface of the object, and if the degree of pressure is great enough it will effect a tight seal at that point, and thus permit the vacuum device to withdraw all loose dust and dirt from the surface of the object directly beneath the brush, as well as from the interior of the hood. When the device is held in the position shown in Fig. 3, the ends of the bristles as they travel across the opening 9 are brought into contact with the surface to be cleaned, and thereby loosen and displace the particles of dirt. The brush being constantly driven by the motor at a high speed, in the direction indicated by the arrows in Figs. 3 and 4, the bristles after acting upon the surface, as 39, successively impinge against the opposite edge of the hood adjacent the mouth of the socket or recess 27. This frictional contact with the hood serves to remove the fine particles of dirt which may cling to the bristles. The rapid movement of the bristles across the openings 9 and 33 of the hood and apron sweeps and scours the exposed portion of the surface of the animal or other object, loosening up all removable dirt or scales, and the travel of the brush being toward the mouth of re-

cess 27, tends to carry the dirt in that direction, where it is instantly sucked or drawn into the said recess and thence into pipe 30 by the vacuum draft. In case the openings in the shaft supply too much air and thereby destroy the vacuum required for withdrawing the dirt from the casing, the end of shaft 2 may be closed by a plug, as 40 or by any other suitable means to prevent air from entering the brush inclosure through the shaft.

The brush having the motor directly attached, as shown and described, may be kept constantly connected-up electrically by means of the wires 26, and a suitable switch or cut-out (not shown) may be employed for controlling the current. In this manner the device may always be ready for immediate use. In connecting up the motor with the conductors, the wires should be arranged so that the brush may be carried about a room without requiring alteration or change of the wiring. The same provision should be made in connection with the pipe or hose 30. This part should be of suitable length and flexibility to permit of the free handling of the brush while employed for cleaning. Under such an arrangement the operator may clean a horse, or other object, and move the brush freely in every direction while engaged in the cleaning operations, without being required to give attention to the electric or vacuum connections.

It is obvious that a solid shaft may be employed instead of the hollow shaft with the plug 40, in all cases where a stronger vacuum is necessary to perform the work properly, and that other changes and modifications may be made within the scope defined by the appended claims, and I therefore do not wish to restrict myself to the precise construction and arrangement as herein shown and described.

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

1. In a vacuum cleaning device, the combination of a cylindrical casing, a brush rotatably mounted therein, means for operating said brush, the lower portion of the casing being formed with an elongated opening through which the bristles of the brush project, a side of the casing at one edge of said opening being formed with a longitudinal recess extending the entire length of the brush and forming an exhaust passage, means for connecting said exhaust passage with a suction device, the inner side of the exhaust passage being deflected inwardly toward the brush so as to engage the end portions of the bristles of the latter during rotation, whereby dirt and foreign matter is cleaned from the brush and exhausted from the casing direct through the exhaust passage aforesaid.

2. In a cleaning device, the combination of a casing comprising a hollow body provided with an opening at its lower portion, end caps detachably applied to the ends of the body, a hollow brush shaft detachably mounted in said end caps and having its bristles arranged to operate adjacent to the opening aforesaid, a clutch supporting one end of the brush shaft on one end cap, the other end cap having a bearing to receive the other end of the brush shaft, and a motor detachably mounted on the end cap having the clutch, the brush shaft having perforations communicating with the interior of the casing, and one end of said shaft being open.

3. In a cleaning device, the combination of a casing comprising a hollow body provided with an opening at its lower portion, end caps detachably applied to the ends of the body, a hollow brush shaft detachably mounted in said end caps and having its bristles arranged to operate adjacent to the opening aforesaid, a clutch supporting one end of the brush shaft on one end cap, the other end cap having a bearing to receive the other end of the brush shaft, and a motor detachably mounted on the end cap having the clutch, the brush shaft having perforations communicating with the interior of the casing, and one end of said shaft being open, a plug for closing the open end of the brush shaft, the casing being formed at one side of the opening in its lower portion with spaced parts forming an exhaust passage, and one wall of which is arranged in the path of movement of the ends of the bristles, and an apron surrounding the opening at the lower portion of the casing and secured to the casing and to the outer wall of the recess above mentioned.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE BACKER.

Witnesses:
HOWARD V. RULISON,
HARRY DE WALLACE.