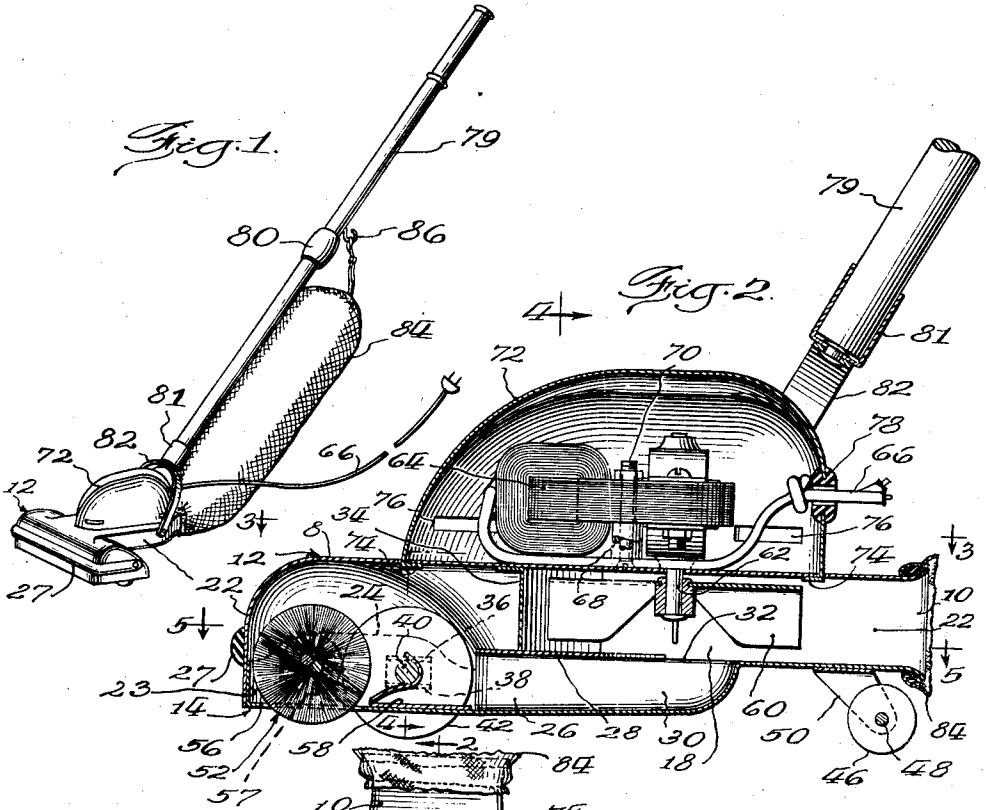
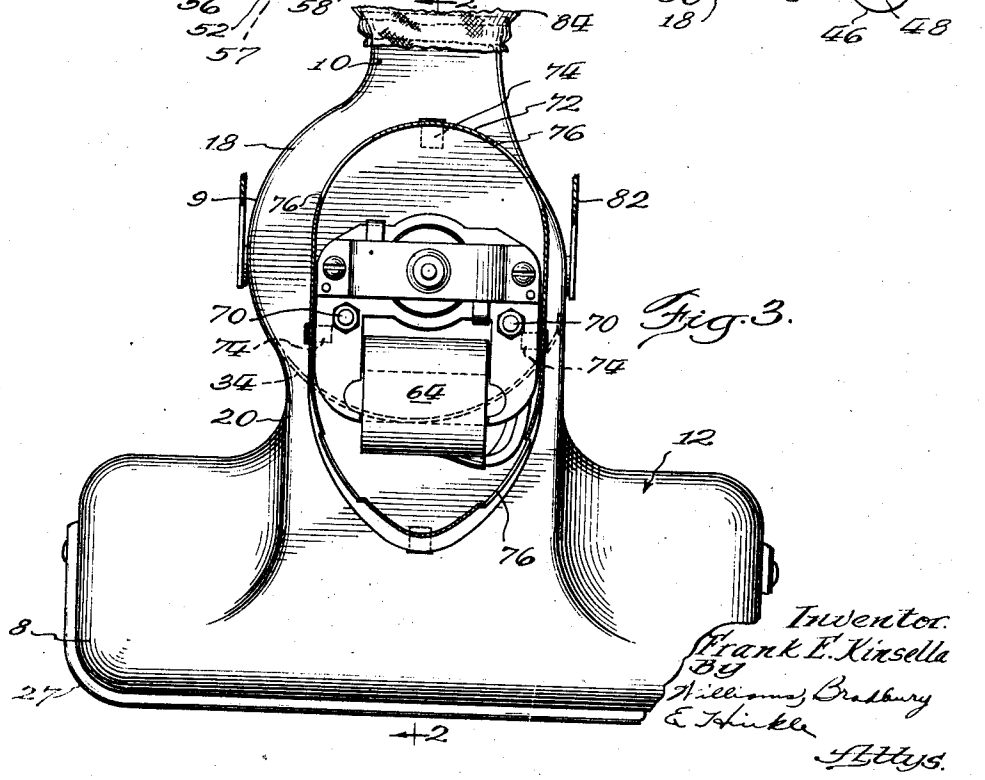
June 29, 1943. F. E. KINSELLA 2,322,804

ELECTRICALLY DRIVEN TOY VACUUM CLEANER

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Fig. 4.

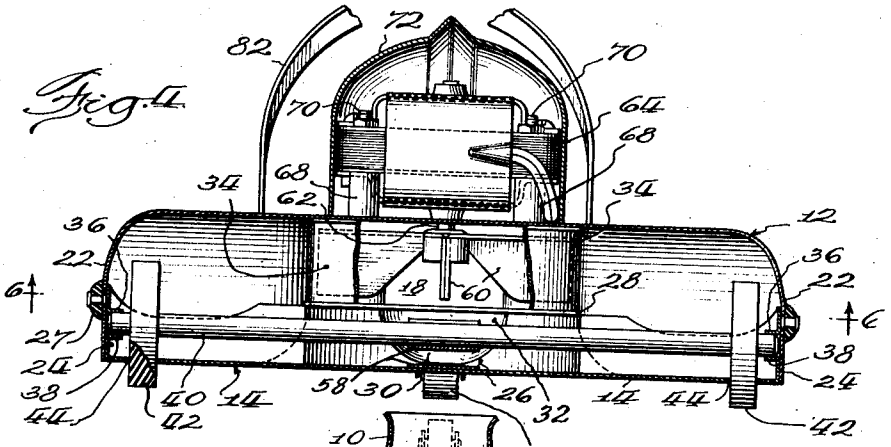


Fig. 5.

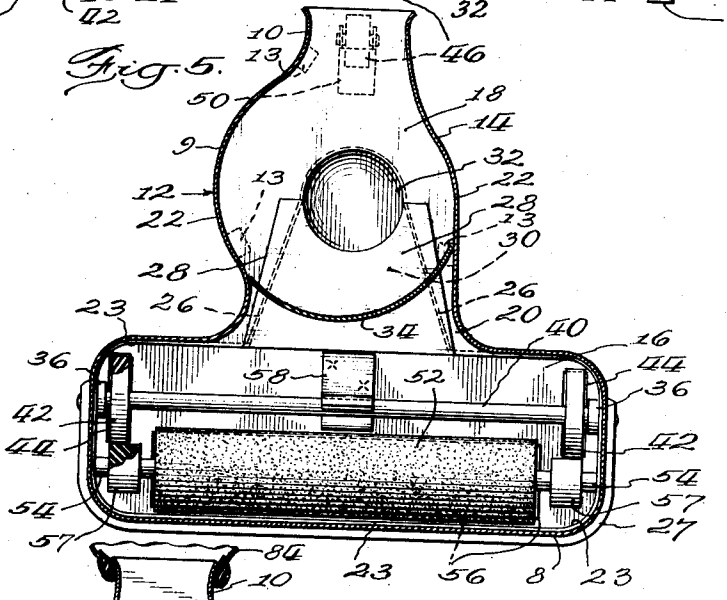
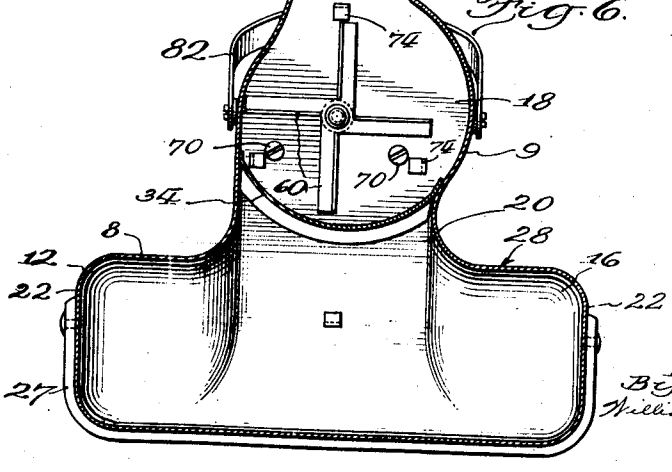


Fig. 6.



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2,322,804

ELECTRICALLY DRIVEN TOY VACUUM CLEANER

Frank E. Kinsella, Chicago, Ill., assignor, by mesne assignments, to David B. Rapaport, Chicago, Ill.

Application October 16, 1940, Serial No. 361,435

4 Claims. (Cl. 15—8)

This invention relates to improvements in toy vacuum cleaners and more particularly to a toy vacuum cleaner which is electrically operated and is capable of cleaning in the same manner as an ordinary household vacuum cleaner.

An object of the invention is the provision of an improved toy vacuum cleaner in which a suction effect is produced by electrical means operating from the house current.

Another object of the invention is the provision of an improved toy vacuum cleaner having a revolving brush which is frictionally driven by the supporting wheels when the cleaner is pushed across the floor.

Another object of the invention is the provision of an improved toy vacuum cleaner which simulates in appearance and operation the ordinary household vacuum cleaner.

Another object of the invention is the provision of a toy vacuum cleaner of simple durable construction which is cheap to manufacture and assemble and yet is sufficiently sturdy in construction to withstand the hard usage to which it will be subjected in the hands of children.

Another object of the invention is the provision in a toy vacuum cleaner of a two piece housing fabricated to form chambers therein for housing the brush and the suction fan and passageways connecting the chambers and providing an outlet therefor.

Another object of the invention is the provision of an electrically operated toy vacuum cleaner which may be safely handled by children.

Other objects will become apparent from the following description, reference being had to the accompanying drawings in which:

Fig. 1 is a perspective view of my toy vacuum cleaner.

Fig. 2 is a vertical sectional view taken on the line 2—2 of Fig. 3.

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2.

Fig. 4 is a sectional view taken on the line 4—4 of Fig. 2.

Fig. 5 is a sectional view taken on the line 5—5 of Fig. 2.

Fig. 6 is a sectional view taken on the line 6—6 of Fig. 4.

Referring to the drawings, the body of the vacuum cleaner comprises a housing having an upper section 12, which as shown in Figs. 3, 5 and 6, is in the form of an inverted T, the forward end portion 8 of the housing being generally rectangular in shape and having an integrally formed rearwardly extending part 9 which terminates in a flaring outlet 10. When the upper housing section is assembled with a lower section 14, the interior is divided into a rectangular shaped brush chamber 16 in the forward end portion 8 thereof, and a generally circular shaped suction chamber 18 in the rearwardly extending part 9 of the housing.

The upper housing section 12 is formed with integral downwardly projecting sides 22 which extend around its perimeter from the outlet 10. The lower housing section 14 is also formed from flat sheet metal and has integral upwardly projecting sides 23 and ends 24 near the forward end thereof forming an open rectangular shaped box-like part which is telescopically received in the corresponding box-like forward end of the upper section 12. Thus, when assembled, the sections 12 and 14 form the brush chamber 16. The lower section 14 also has a generally triangular shaped recessed portion 26 extending rearwardly from the side 23 of the box-like port and terminating in an inlet opening 32 in the suction chamber 18.

The two sections of the housing are held in assembled relation by soldering the lower edges of the sides of the rearwardly extending part of the upper section 12 to the edges of the lower section 14 of the housing around the suction chamber 18. Ears 13 on the edges of the rearwardly extending part of the upper section 12 are bent over against the bottom section 14 and soldered thereto further strengthening the bond between the two sections.

A decorative and protective rubber bumper 27 is riveted to the outside of the downwardly extending ends of the box-like forward end of the upper section of the housing and extends along the front of the housing.

The recess 26 in the lower section 14 of the housing is covered by a plate 28 which is secured to the top surface of section 14 by spot welding. Between the plate and the recess, a passageway 30 is formed which leads directly from the brush chamber 16 to the suction chamber 18 and communicates with the latter through a circular opening 32 formed by the semi-circular end of the plate 28 and the semi-circular end of the recess 26. Air and dust drawn from the brush chamber 16 flow directly to the suction chamber 18 through the passageway 30 and do not come in contact with the electric motor which would soon become clogged by dust and dirt carried in the air flowing to the suction chamber.

A semi-circular sheet metal partitioning strip 34 which forms a part of the wall of the suction chamber, as shown in Figs. 2 and 6, has a flanged

edge which is spot welded to the inside surface of the upper section 12 to separate the brush chamber 16 from the suction chamber 18.

Horizontally extending flanges 36 and 38 are formed in the upwardly projecting ends 24 of the box-like forward end of the bottom section 14 of the housing by bending the metal inward at right angles to the ends 24 as shown in Figs. 4 and 5. A shaft 40 which extends longitudinally of the brush chamber 16 is supported in and guided by the flanges 36 and 38 and has secured thereon a pair of rubber supporting wheels 42 which extend through slots 44 in the bottom of the brush chamber and support the forward end of the cleaner. The rear end of the cleaner is supported by a trailer wheel 46 which rotates on a shaft 48 secured in the arms of a yoke 50. Yoke 50 is mounted on the bottom section 14 of the housing near the outlet end thereof by welding or other suitable means.

The brush chamber 16 houses a cylindrical brush 52 which is secured on a brush shaft 54. The brush 52 extends through a rectangular shaped opening 56 in the bottom of the brush chamber 16 a sufficient distance to permit contact with the floor and to cause dust to be raised by the rotation of the brush when the cleaner is moved across the floor. Shaft 54 is journaled in the upwardly projecting ends 24 of the bottom of the housing and has secured thereon rubber friction rollers 57 which engage the supporting wheels 42.

In addition to supporting the forward end of the cleaner when it is moved about on the floor the supporting wheels 42 also act as drivers for the brush shaft 54 and brush 52. Rotation of the supporting wheels is imparted to the brush 52 through the friction rollers 57 and brush shaft 54 and due to the difference in diameters of the wheels and rollers the brush is driven at higher speed than the wheels 42, so that the ends of the brush bristles will sweep the dust etc. into the brush chamber 16.

A generally Z-shaped spring 58 which is mounted on the bottom of the brush chamber bears against the shaft 40 intermediate its ends and urges the shaft in a forward direction thereby at all times maintaining the supporting wheels 42 in firm contact with the friction rollers 57.

A suction fan 60 is suspended in the suction chamber 18 in the housing upon the shaft 62 of an induction motor 64. Motor 64 is operable from the house current, to which it may be connected by a cord 66 having a plug on one end for insertion in an ordinary house socket. The motor is supported over the suction chamber in the housing upon two tube washers 68 to which the field laminations of the motor are secured by a pair of bolts 70.

The motor is completely inclosed by a hood 72 of stamped sheet metal. Projecting ears 74 on the lower edge of the hood are inserted in slots in the top section 10 of the housing and are bent over against the inner surface of the housing to hold the hood in place. To prevent overheating of the motor 64, the hood is provided with ventilating openings 76 in its sides which permit the flow of fresh air through the hood and around the motor. Cord 66 passes through an insulating grommet 78 in the back of the housing and has a knot therein which acts as a stop to prevent a pull in the cord from being exerted directly on the connection of the cord to the motor.

The cleaner is provided with a handle 79 of suitable length consisting of two sections joined together by a collar 80 to permit the handle to be disassembled when the cleaner is packed in a box for shipment or sale. The lower end of the handle is removably held in a socket 81 secured to the intermediate part of a yoke 82, the arms of which are pivotally secured to the sides of the upper part 12 of the housing along the suction chamber therein.

A dust bag 84 has its upper end removably secured to a hook 86 on the handle 79 and has an opening at its lower end. The bag may be slipped over the end of the outlet 10 and is held in place thereon by an elastic band encircling the outlet 10. It is apparent that the bag is readily removable from the cleaner to permit its cleaning.

An important consideration in the construction of every toy is the cost of manufacture, which in the vacuum cleaner of this invention has been reduced to a minimum through the use of the housing disclosed in this application and through the novel arrangement of parts which permits the rapid assembling of the cleaner. The housing being formed of two sections stamped from sheet metal is of very inexpensive construction. The channeled construction which results from the integral downwardly extending sides of the top section of the housing greatly increases its strength and rigidity so that it can withstand hard usage, although constructed of light stock.

Before assembling the two sections of the housing, the motor 64, hood 72, partitioning strip 34 and bumper 27 are secured to the upper part of the housing, and the fan 60 is secured on the shaft of the motor. In a like manner the plate 28 and spring 58 are spot welded to the lower section, and the supporting wheels 42, brush 52 and friction rollers 57 are assembled on their shafts which are inserted in the lower section. With the various parts secured to or in the sections the assembling of the housing is completed by telescoping the box-like forward end of the lower section 14 into the corresponding part of the upper section 12 and soldering the edges of the two sections together along the suction chamber.

In addition to the advantages gained by the inexpensive but sturdy construction thus provided, the cleaner herein described will be less likely to develop motor trouble because the motor 64 which operates the suction fan 60 is mounted on top of the housing out of the path of flow of dust-laden air. The recessed passageway 30 in the lower section of the housing provides a direct means of communication between the brush chamber 16 and suction chamber 18 and makes it unnecessary for dust-laden air to flow through the motor housing where it would soon clog the motor.

The passageway 30 communicates with the suction chamber 18 through the centrally located opening 32 in the bottom of the chamber, which is also adjacent to the center of the fan 60 so that the fan operates very efficiently considering the fact that the apparatus is merely a toy. As a result, all dust or dirt drawn into the chamber is expelled from the outlet with the air.

While I have shown and described a particular embodiment of my invention it will be apparent to those skilled in the art that numerous variations and modifications thereof may be made without departing from the underlying principles of the invention. I, therefore, desire, by the following claims, to include within the scope of my invention such similar and modified forms by which substantially the results of the inven-

tion may be obtained by substantially the same or equivalent means.

I claim:

1. In a toy vacuum cleaner having a housing comprising an upper section defining and forming a closed top and side walls and a lower section forming the bottom of a brush chamber, the bottom of a suction chamber, and the bottom of an outlet for said suction chamber, and a passageway in said lower section connecting said chambers, the combination including a cylindrical brush rotatably mounted in the forward end of said brush chamber said brush being adapted to contact the surface to be cleaned, a shaft in said brush chamber to the rear of said brush, said shaft being supported for horizontal movement therein, supporting wheels secured on said shaft, rollers on said brush frictionally engaging said wheels for rotating said brush when said wheels are rotated, resilient means secured on the bottom of said brush chamber for urging said shaft in a forward direction to maintain said wheels and said rollers in non-slipping engagement, an electric motor secured to the top of the upper section of said housing and having its shaft projecting into said suction chamber, a suction fan secured on the shaft of said motor, said fan drawing air from said brush chamber to said suction chamber through the passageway in the lower section of said housing and forcing it from said outlet, and a hood for said motor secured on the upper section of said housing.

2. In a toy vacuum cleaner a housing comprising an upper section defining a brush chamber, a suction chamber and an outlet for said suction chamber, said housing including a lower section having a boxlike forward end telescopically received in the forward end of said upper section to form therewith a brush chamber, said lower section also having a rearwardly extending part forming a bottom for said suction chamber and outlet; a partitioning strip in said housing separating said brush chamber and suction chamber, a recess in said lower section between said brush chamber and said suction chamber, and a plate secured over said recess and forming therewith a centrally located inlet in the bottom of said suction chamber and a passageway in the lower section of said housing directly connecting said brush chamber to the inlet of said suction chamber.

3. In a toy vacuum cleaner the combination including a housing having an upper section defining the top and side walls of a brush chamber, suction chamber and an outlet for said suction chamber and a lower section having a boxlike forward end telescopically received in the forward end of said upper section and forming the bottom of said brush chamber and a recessed rearwardly extending part forming a bottom for said suction chamber and outlet and defining in its recessed portion a passageway connecting said brush chamber and suction chamber; electrically driven suction means in said suction chamber for drawing air directly from said brush chamber and expelling it from said outlet, a plate secured over the recessed portion of the lower section of said housing and forming the top of a passageway connecting said brush chamber and suction chamber and a partition secured to the upper section of said housing to form part of the wall of said suction chamber, said partition cooperating with said plate to prevent the flow of air from said brush chamber to said suction chamber except through said passageway.

4. In a toy vacuum cleaner the combination including a generally T-shaped housing having an upper section formed with a boxlike forward end and an integral rearward projection with depending sides, a lower section having a boxlike end telescopically received in the forward end of the upper section and forming therewith an enclosed brush chamber, said lower section also having an integral recessed rearward projection secured to the edges of the depending sides of said upper section and forming therewith the bottom portion of a suction chamber and of an outlet for said suction chamber, said recessed portion of said lower section defining a passageway providing direct communication between said brush chamber and said suction chamber; an electrically driven suction fan in said suction chamber for drawing air from said brush chamber to said suction chamber and expelling it from said outlet, and means in said housing separating said suction chamber from said brush chamber and restricting communication therebetween to said passageway.

FRANK E. KINSELLA.