June 30, 1959 D. H. BRENNAN ET AL 2,892,203

SECTIONAL HANDLE FOR ELECTRIC FLOOR MACHINE

Filed Oct. 25, 1957

Fig. 4.

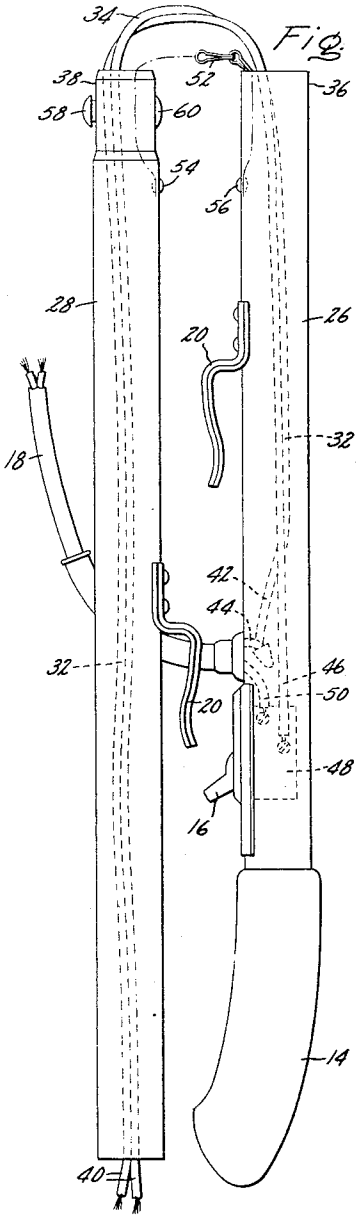


Fig. 5.

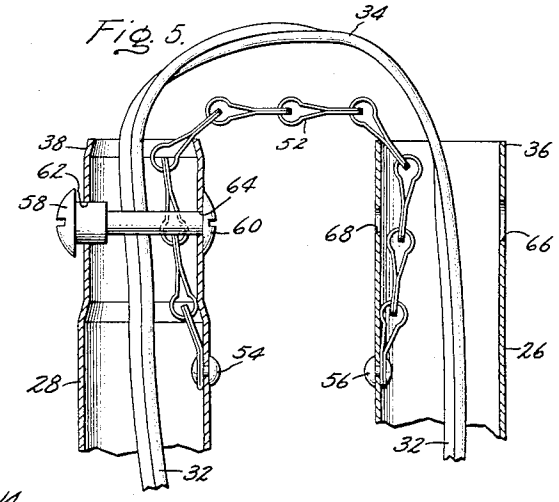


Fig. 1.

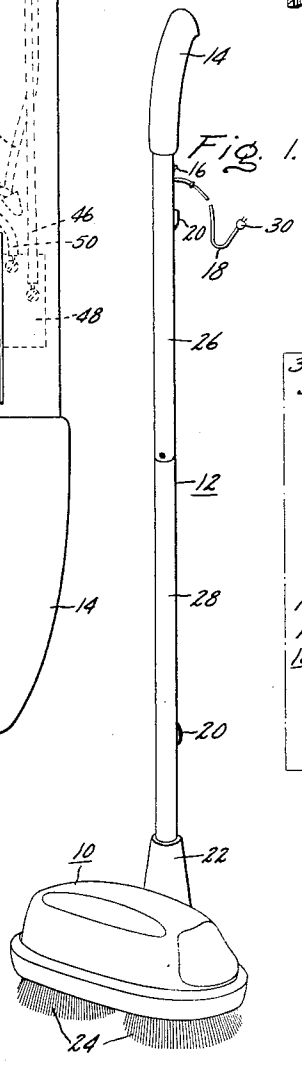


Fig. 2.

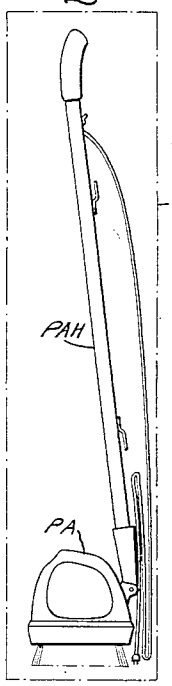


Fig. 3.

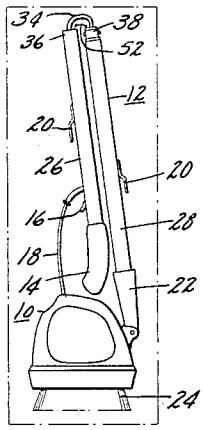
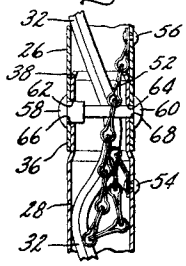


Fig. 6.



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SECTIONAL HANDLE FOR ELECTRIC FLOOR MACHINE

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Application October 25, 1957, Serial No. 692,369

5 Claims. (Cl. 15—143)

The invention relates to electric floor machines, and particularly to an improvement in the handle thereof.

Electric floor machines, such as upright vacuum cleaners and floor polishers, are normally provided with an elongated, rigid, unitary handle which is utilized to maneuver them about. In such machines, a manually operable, electric switch is frequently mounted in the handle adjacent to the handle grip for convenient operation by the user, and an electric wire extends from the switch through the handle to the electric motor of the machine, which is normally located in a body that rests on the floor. Electric floor machines of this type possess a serious deficiency in that they require a large packing carton to accommodate them; in practice it has been found that a typical electric floor polisher having an elongated, rigid, unitary handle of conventional length requires a packing carton approximately 47 inches high. It will be apparent that the cost of the carton and the cost of shipping the carton are higher than they would be if the handle were split into two or more sections, thereby allowing the use of a smaller carton. Another serious fault incident to the use of large cartons is that the packaged floor machine is not normally likely to be carried out of a store by a customer, and therefore, the additional cost of home delivery is required.

In view of the highly competitive nature of the electric appliance industry, the presence of unnecessary costs in manufacture or marketing is odious. The art has recognized the desirability of reducing the size of packing cartons, and to effect this end has devised an electric floor machine having a sectional handle; however, this prior art arrangement utilizes a switch that is mounted in the body of a floor machine, which is, therefore, not convenient to the user, and has an electric wire clamped to the outside of the handle, which is unsightly.

It is an object of this invention to provide an improved electric floor machine having an elongated handle, which is capable of being packed in small packing cartons, because its elongated handle is built of sections, wherein the electric switch is located in the handle adjacent to the handle grip, wherein the electric wire that connects the electric switch to the electric motor is located within the handle, and wherein means is provided to prevent subjecting the electric wire connections to strain or damaging the electric wire prior to final assemblage of the sections into the elongated handle or thereafter in the event of inadvertent separation of the sections.

The object of this invention is achieved in one form by providing in an electric floor machine, a handle which is made of two tubular sections, providing a handle grip at one end of one of the sections, connecting the other section at one of its ends to the body of the electric floor machine, disposing an electric wire in both of the sections, connecting one end of the electric wire to the electric motor in the floor machine and the other end of the electric wire to a manually operable switch that is disposed adjacent to the handle grip, and providing a

strain relief between adjacent ends of the sections which is shorter in length than the portion of electric wire that extends between the two sections when they are disconnected.

Other objects and further details of that which we believe to be novel and our invention will be clear from the following description and claims taken with the accompanying drawing wherein:

Fig. 1 is a perspective view of a fully assembled, electric floor polisher embodying the instant invention;

Fig. 2 illustrates a prior art, electric floor polisher having an elongated, rigid, unitary handle schematically illustrated in a packing carton;

Fig. 3 shows an electric floor polisher which incorporates the instant invention schematically illustrated in a packing carton; Fig. 3 is drawn on the same scale as Fig. 2;

Fig. 4 is a side elevational view of the sectional handle contemplated by the instant invention, illustrated in disconnected condition prior to being assembled into an elongated handle;

Fig. 5 is a fragmentary sectional view taken centrally through the disconnected adjacent ends of the tubular sections comprising the sectional handle, and

Fig. 6 is a fragmentary sectional view taken centrally through the connected adjacent ends of the tubular sections after they have been assembled to form an elongated handle.

Fig. 1 illustrates a fully assembled, electric floor polisher that incorporates the instant invention. It will be understood that the instant invention may be incorporated in other types of electric floor machines, such as vacuum cleaners of the upright type, and that it is illustrated and will be disclosed with reference to an electric floor polisher solely for the purpose of exemplification.

The electric floor polisher illustrated generally comprises a body **10** and an elongated handle **12**. The upper end of the handle is free and supports a grip **14**, and an electric switch **16** and electric cord **18** are secured to the handle adjacent to the handle grip. If desired, a pair of hooks **20** may be mounted on the handle to serve as a means for supporting coiled electric cord when the floor polisher is stored. The lower end of the handle **12** is rigidly secured to a socket **22**, which in turn may be pivotally secured to a rear portion of the floor polisher body **10**. The floor polisher body houses a conventional electric motor within it (not shown), and appropriate mechanism for driving a pair of floor contacting members **24**, which may be in the form of rotary brushes or the like.

The electric floor polisher described thus far with reference to Fig. 1 may be considered to be of a predetermined fixed height, that is, when it is fully assembled and its elongated handle is located so as to extend upwardly, it is of a determinable fixed height. In marketing electric floor polishers, it is customary that they be packaged in a packing carton and shipped to a distributor or dealer, who in turn resells them, ultimately to a consumer. Throughout the process of marketing, the original factory packing carton is normally the sole container utilized. Prior art, electric floor polishers of substantially the same size as that of the Fig. 1 electric floor polisher customarily require a packing carton which is approximately 47 inches high. This is illustrated schematically in Fig. 2, wherein the prior art, electric floor polisher PA is illustrated packaged in a rather tall, prior art carton PAC, which is necessitated by the length of the unitary, elongated, prior art handle PAH.

In order to reduce the size of the packing carton, the instant invention contemplates making the elongated handle **12** into two separate tubular sections **26** and **28**.

When fully assembled, as illustrated in Fig. 1, the electric floor polisher incorporating the instant invention operates in substantially the same manner as the prior art, electric floor polisher illustrated in Fig. 2. The fully assembled handle **12** is the operationally equivalent of the unitary prior art handle PAH. In use, the electric cord **18**, which has a conventional electric plug **30** secured at its free end, is located relative to the handle **12** so as to cause minimum interference with the operation of the floor polisher, and the electric switch **16** is located adjacent to the handle grip **14** in a very convenient position for manual operation by the user.

In order to allow for the utilization of a substantially smaller packing carton than the prior art, packing carton PAC, the handle **12** is formed into the referred-to tubular sections **26** and **28**, and packaged and shipped in a "broken down" condition, illustrated in Fig. 3. When packaged as illustrated in Fig. 3, it has been found in practice that a packing carton only approximately 28 inches high is required. In order to allow for the electric floor polisher to be packaged in the Fig. 3 condition and still provide for the switch **16** to be located adjacent to the handle grip **14**, and further, to house the electric wire **32** that extends from the electric motor in the floor polisher body **10** to the electric switch **16** completely within the handle, it is necessary to provide some means for preventing strain on the electric wire connections and damage to the electric wire prior to finally asembling the floor polisher into its Fig. 1 condition.

By reference particularly to Figs. 4 and 5, it will be observed that the electric wire **32** extends through both of the tubular sections **26** and **28**, and that prior to assembling the handle into its elongated Fig. 1 condition, a portion **34** of the electric wire extends outside of the tubular sections between the adjacent ends **36** and **38** of the sections **26** and **28**, respectively. One end of the electric wire **32** is formed into a pair of leads **40** which are adapted to be electrically connected to the electric motor that is housed in the floor polisher body **10**. The other end of the electric wire **32** is split into a pair of leads, one identified as **42** and which is connected to one of the leads **44** from the electric cord **18**, and the other of which is identified as **46** and is adapted to be electrically connected to the switch body **48** of the switch **16**. The other lead **50** of the electric cord **18** is electrically connected to the switch body **48** to complete the wiring. It will be understood that the circuitry involved is not novel in and of itself, but that it is the purpose of this invention to retain the desirable prior art wiring, wherein the electric wire is located within the handle and the electric switch is located at a point adjacent to the handle grip, while obtaining the benefits of a sectional handle.

With a sectional handle as described thus far, there is the distinct possibility, in fact likelihood, that the portion **34** of the electric wire **32** or the electrical connections made by the leads **40**, **42** and **46** will be damaged prior to the time when the tubular sections **26** and **28** are assembled into the elongated handle **12** illustrated in Fig. 1. In order to prevent such damage prior to assembly of the tubular sections, or thereafter in the event of their inadvertent separation, a strain relief is provided between the adjacent ends **36** and **38** of the tubular sections **26** and **28**, respectively.

The strain relief may take various forms, a particular one which has been found to be successful in practice is that of the flexible metal chain **52**. The chain **52** is secured at one of its ends to the inner side of the end **38** of tubular section **28** by a riveted construction or equivalent securing means **54**. The other end of the chain **52** is secured to the inner side of the end **36** of the tubular section **26** by the riveted constructon **56** or equivalent securing means. The electric wire **32** is selected so as to provide a portion **34** which projects out of the adjacent ends **36** and **38** when the tubular sections **26** and **28** are disconnected, and which is in excess of the length of strain relief chain **52**.

In Figs. 3, 4 and 5, it will be observed that the portion **34** of the electric wire **32** is in excess of the length of the strain relief chain **52**, and therefore, that there will never be occasion for the electric wire to rub up against the free edges of the ends **36** and **38** and thereby be damaged or for the electrical connections made by the electric wire leads **40**, **42** and **46** to be subjected to strain, either prior to the tubular sections **26** and **28** being assembled, or in the event that after assembly the elongated handle should inadvertently separate into its separate sections. As can best be seen in Fig. 3, the strain relief chain **52** functions in such a manner as to allow the disconnected tubular section **26** to hang freely and be supported by the strain relief chain without damaging the electric wire **32** or subjecting the electric wire connections to strain when the floor polisher is "broken down" and packaged. It should be understood that the strain relief chain also functions to prevent subjecting the electric wire connections to strain when the handle is separated and the entire floor machine is lifted off the floor by one section; in this event, the weight of the other section is born by the strain relief chain rather than the electric wires.

It will be understood that an electric floor polisher incorporating the instant invention may have its tubular sections **26** and **28** disconnected and be packaged for shipment in a relatively short packing carton, as illustrated in Fig. 3. When it is packaged, a headed nut **58** and a threaded bolt **60** may be disposed in aligned openings **62** and **64**, respectively, which are formed in the end **38** of the tubular section **28**, and the threaded bolt may be threadedly secured to the headed nut. On arrival at the point of assembly, the carton is opened and the floor polisher is removed. In order to assemble the floor polisher for operation, it is simply necessary to remove the threaded bolt **60** and the headed nut **58** from the end **38** of the tubular section **28**, and connect the tubular sections **26** and **28** by inserting the end **38** into the end **36**. It has been found in practice that during such insertion, the strain relief chain **52** and the portion **34** of electric wire **32** slide into the tubular sections without impeding connections of the tubular sections. When the ends **36** and **38** are connected, the openings **62** and **64** are aligned with the aligned openings **66** and **68** formed in the end **36** of the tubular section **26**. The headed nut **58** is inserted from the exterior into the aligned openings **66** and **62**, the threaded bolt **60** is inserted from the exterior through the aligned openings **68** and **64**, and the threaded bolt is threadedly secured within the headed nut. The finally assembled condition of the handle **12** is illustrated in Fig. 1, and in Fig. 6, the finally assembled condition of the connected ends **36** and **38** of the tubular sections and their associated parts, including the chain strain relief **52**, the portion **34** of the electric wire **32**, the headed nut **58** and the threaded bolt **60**, is illustrated.

In view of the foregoing, it will be observed that a sectional handle has been provided for an electric floor machine, wherein an electric wire is completely housed within the handle, and extends between and is connected to an electric motor in the floor machine body and an electric switch located adjacent to a grip formed on the free end of the handle, wherein the construction is such as to allow for a minimum sized, packing carton when packaging the floor machine, and wherein the possibility of damage to the electric wire connections or the electric wire during shipment when the handle is disconnected into two tubular sections, or after final assembly of the handle in the event the latter should become inadvertently disassembled, is eliminated. It will be observed that the desired advantage of allowing for reducing the size of the packing carton is achieved without sacrificing the convenience or appearance of the final assembled floor machine, as by having the switch

located on the floor machine body itself or by having electric wire disposed on the outside of the handle and clamped thereto, as is the case in certain prior art devices of this type.

As will be evident from the foregoing description, certain aspects of our invention are not limited to the particular details of construction of the example illustrated, and we contemplate that various and other modifications and applications will occur to those skilled in the art. It is, therefore, our intention that the appended claims shall cover such modifications and applications as do not depart from the true spirit and scope of our invention.

What we claim as new and desire to secure by Letters Patent of the United States is:

1. An electric machine comprising: a body, an electrically operated device in said body, an elongated hollow handle supported at one of its ends by said body, a manually operable electric switch mounted in said handle near its other end; an elongated electric wire disposed within said handle and connected at one of its ends to said device and at the other of its ends to said switch; said handle being formed by two separate tubular sections; means for rigidly connecting said sections together to form said handle; and an elongated collapsible member secured to the adjacent ends of said tubular sections; said member having a portion that extends outside of said adjacent ends when said tubular sections are disconnected, said electric wire having a portion that extends outside of said adjacent ends when said tubular sections are disconnected, and the portion of said electric wire being longer than the portion of said member, whereby said member functions as a strain relief for said electric wire when said tubular sections are disconnected.

2. A machine as defined in claim 1 wherein said connecting means comprises cooperating coupling means formed on said adjacent ends; each of said adjacent ends is provided with a pair of aligned openings; and securing means is located in said pairs of openings when said adjacent ends are coupled to each other with said pairs of openings aligned to thereby connect said tubular portions.

3. A machine as defined in claim 1 wherein said device comprises an electric motor; and said body supports movable floor treating means which is operatively connected to said motor; whereby said machine may be utilized to treat a floor, and said switch may be utilized to control said motor.

4. A device as defined in claim 1 wherein said member comprises a collapsible chain that is secured at one of its ends to the interior of one of said adjacent ends, and which is secured at the other of its ends to the interior of the other of said adjacent ends.

5. An electric floor machine comprising: a body; an electric motor in said body; movable floor treating means supported by said body and operatively connected to said motor; an elongated hollow handle supported at one of its ends by said body; a manually operable electric switch mounted in said handle near its other end; an elongated electric wire disposed within said handle and connected at one of its ends to said motor and at the other of its ends to said switch; an elongated electrical cord being principally disposed on the exterior of said handle, being connected to said switch at one of its ends and supporting an electrical plug at its other end; said handle being formed by two separate tubular sections that are adapted to be rigidly connected to form said handle; said tubular sections having cooperating coupling means formed on their adjacent ends; and a collapsible chain that is secured at one of its ends to the interior of one of said adjacent ends, and which is secured at the other of its ends to other of said adjacent ends; a portion of said chain and a portion of said electric wire extending outside of said adjacent ends when said tubular sections are disconnected, and the portion of said electric wire being longer than the portion of said chain, whereby said chain functions as a strain relief for said electric wire when said tubular sections are disconnected.

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