

[54] **CLEANING NOZZLE ATTACHMENT FOR A SUCTION CLEANER**[75] Inventors: **Joseph F. Brooks**, Bloomington;
Robert B. Meyer, Normal, both of Ill.[73] Assignee: **National Union Electric Corporation**, Greenwich, Conn.[22] Filed: **Jan. 11, 1974**[21] Appl. No.: **432,679****Related U.S. Application Data**

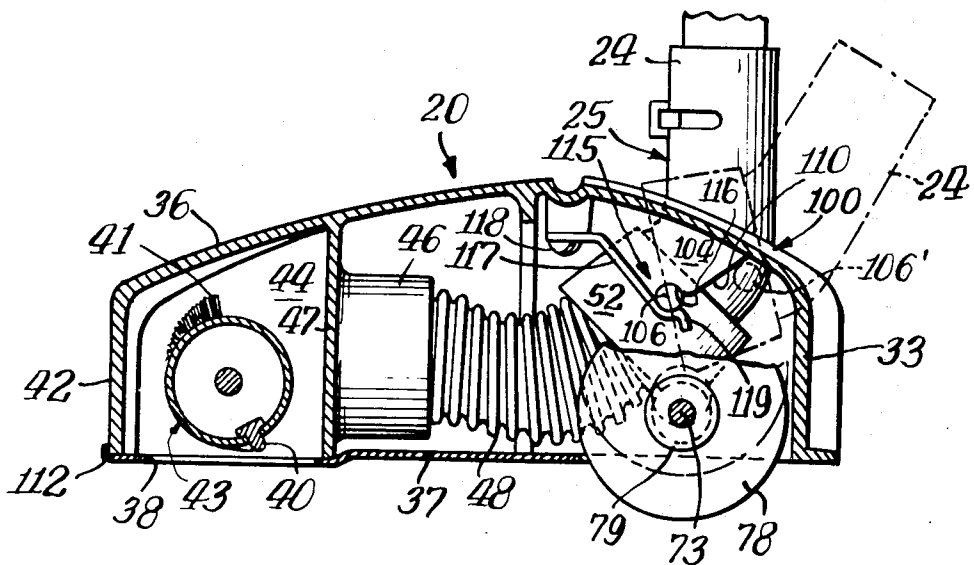
[62] Division of Ser. No. 268,126, June 30, 1972, Pat. No. 3,815,170.

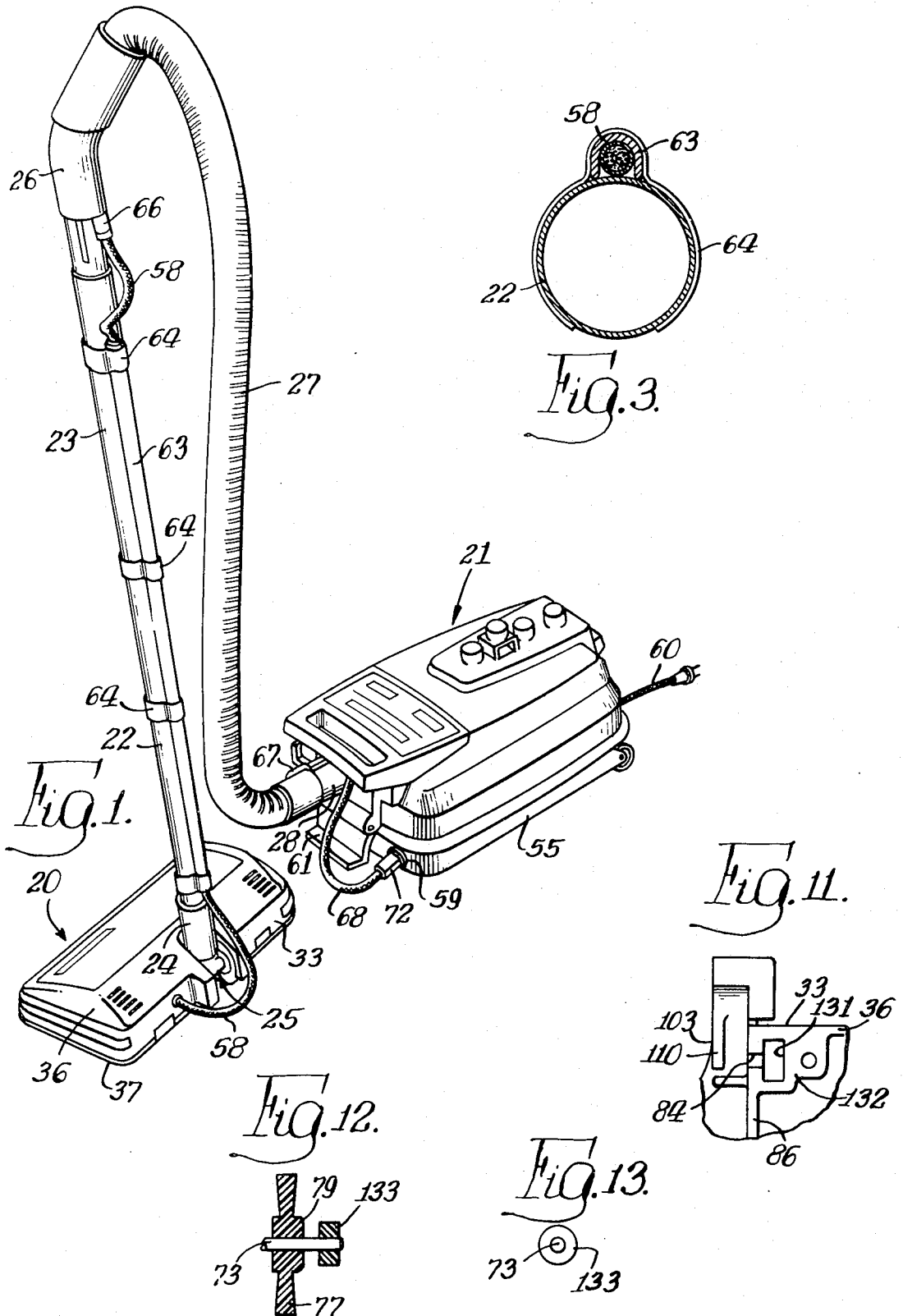
[52] U.S. Cl. **15/383; 15/361; 15/410**[51] Int. Cl.² **A47L 9/04**[58] Field of Search **15/333, 361, 377, 410, 15/383**[56] **References Cited****UNITED STATES PATENTS**2,485,363 10/1949 Coss..... 15/361 X
2,763,887 9/1956 Brace..... 15/361**FOREIGN PATENTS OR APPLICATIONS**

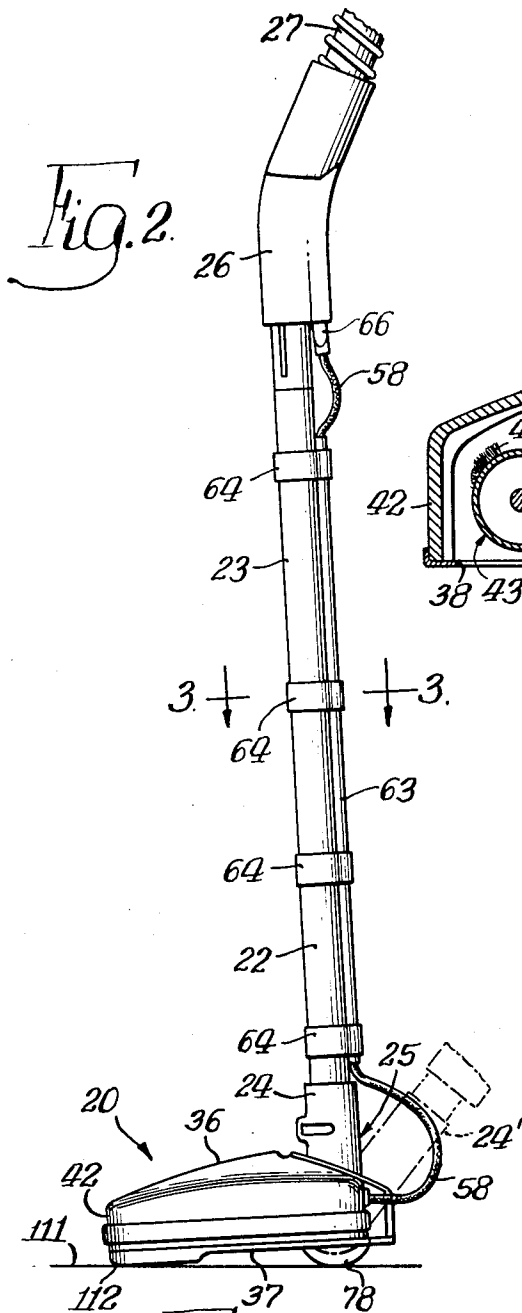
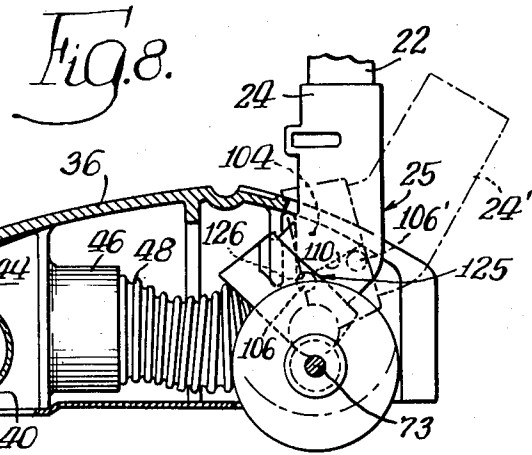
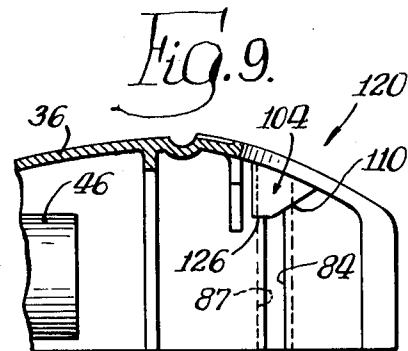
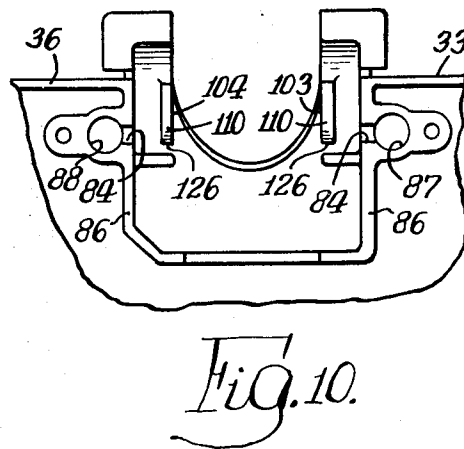
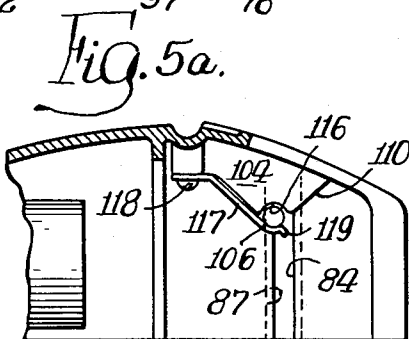
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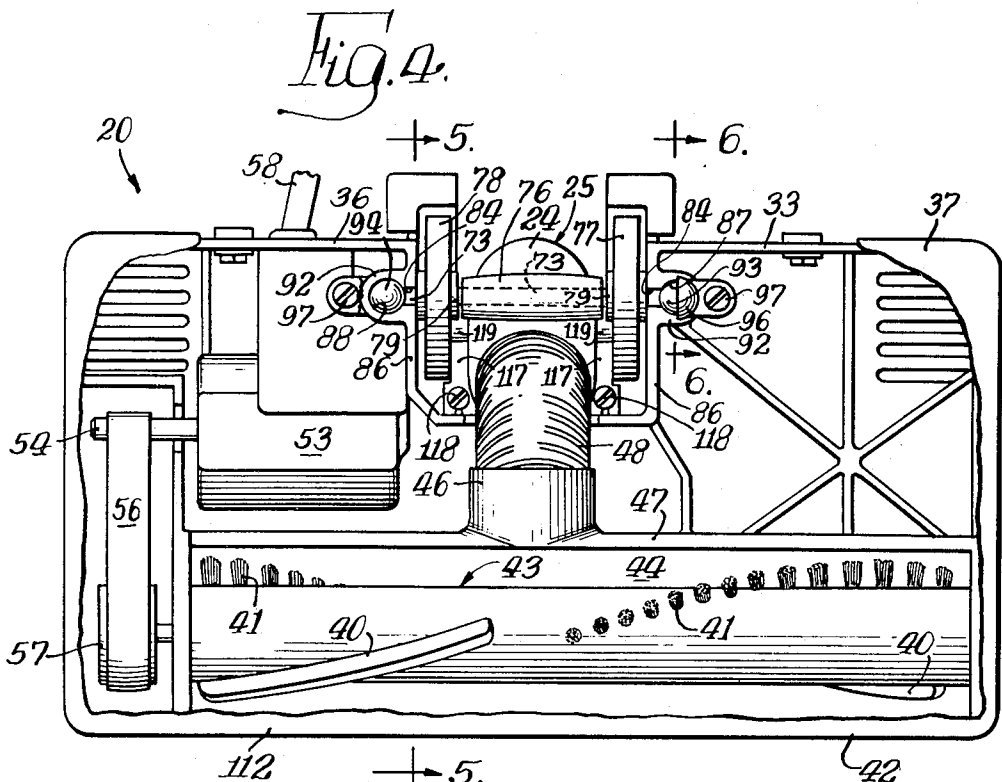
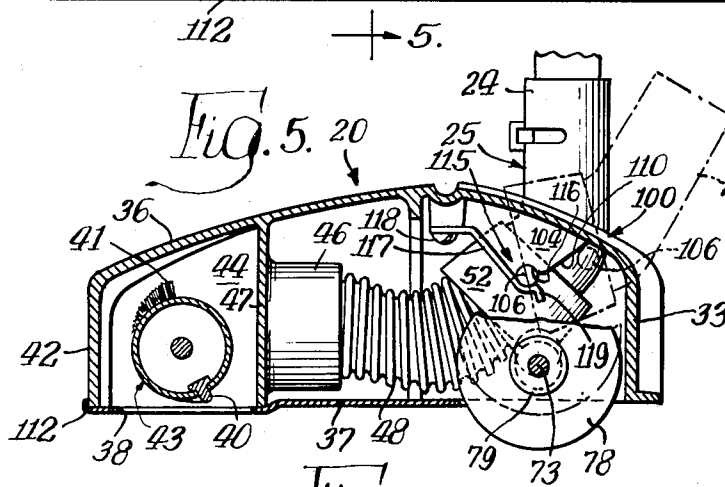
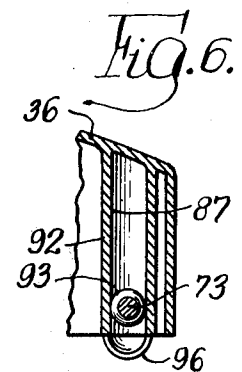
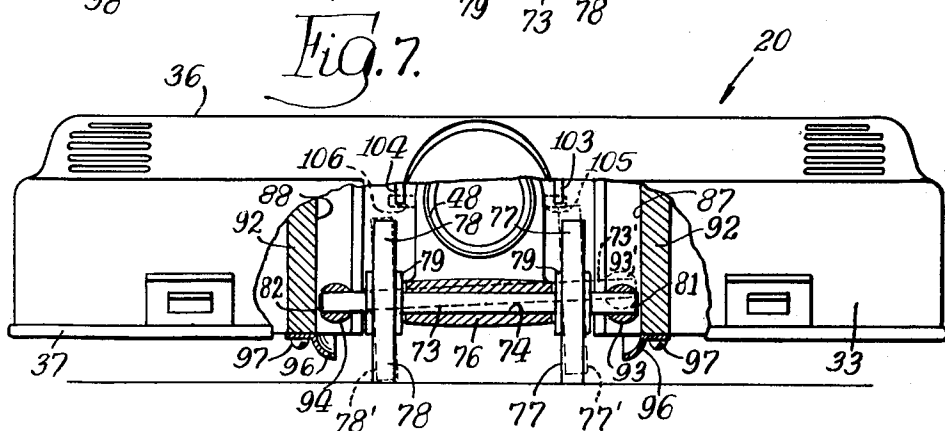
Primary Examiner—Peter Feldman*Assistant Examiner*—C. K. Moore*Attorney, Agent, or Firm*—Hibben, Noyes & Bicknell[57] **ABSTRACT**

A cleaning nozzle attachment for a canister-type suction cleaner or built-in cleaning system, wherein an electric motor driven brush roll is rotatably mounted in a suction chamber in the body of the attachment so as to agitate a portion of the rug or carpet underlying the suction opening of the attachment when the latter is in operation. A socket member is pivotally mounted at the rear of the body and serves to communicate suction to the suction chamber through a plurality of connected tubular wands which are detachably connected to the socket member and which provide a handle for manipulating the attachment. A pair of wheels are carried by the wand socket member and the downward thrust component from the wands is transmitted to the wheels rather than to the socket member by mounting the wheels on the socket member so that the wheel axis is substantially intersected by the axis of the wands. A lost motion connection between the wand socket member and the nozzle body permits substantially vertical relative movement therebetween so that the nozzle body "floats" bodily on the surface of a rug or carpet being cleaned. A pair of ramps are provided on the nozzle body, which coast with a pair of trunnion pins on the wand socket member to cause the wheels to be positively extended to a predetermined lowered position with respect to the underside of the nozzle body when the wands and socket member are pivoted to an upright position.

11 Claims, 14 Drawing Figures







CLEANING NOZZLE ATTACHMENT FOR A SUCTION CLEANER

This is a division of application Ser. No. 268,126, filed June 30, 1972, now U.S. Pat. No. 3,815,170.

This invention relates to attachments for vacuum cleaners, and more particularly relates to a rug and carpet cleaning nozzle attachment which incorporates an electric motordriven brush roll to improve the cleaning action thereof and which "floats" on the surface of a rug or carpet so that an optimum cleaning action is obtained.

Various types of attachments or accessory tools have been heretofore developed for use with Vermeulen, canister and uprighttype vacuum cleaners, in order to improve the efficiency of such cleaners and to extend their usefulness. Some of the attachments heretofore developed for use with canister-type cleaners have attempted to duplicate the cleaning efficiency of upright cleaners on rugs and carpets by incorporating rotatable agitators in the suction openings of the attachments to impart a beating and sweeping action to the surfaces of the rugs or carpets being cleaned. Examples of the latter type of attachment are disclosed in the Gerber, U.S. Pat. No. 2,591,250, Sparklin et al., U.S. Pat. No. 2,980,939, Vermeulenn, U.S. Pat. No. 3,184,776 and Ferraris et al., U.S. Pat. No. 3,387,319 patents.

Cleaning nozzle attachments of the type disclosed in the aforementioned patents have not provided entirely satisfactory for various reasons. One reason is that many of the attachments did not make any provision for compensating for irregularities in the surface and/or thickness of the rug or carpet being cleaned. Consequently, the nozzle openings thereof did not at all times make good contact with the surface of the rug or carpet being cleaned and cleaning efficiency was therefore reduced. In addition, cleaning nozzle attachments of the type disclosed in the aforementioned patents were difficult to push on a shag carpet.

Some of the nozzle attachments heretofore advanced did attempt to compensate for irregularities in the surface and/or thickness of the rug or carpet being cleaned by permitting the nozzle body to "float" on the surface of the rug or carpet. An example of an attachment of this type is disclosed in the Hurd, U.S. Pat. No. 2,842,793. The floating action provided by the Hurd attachment is, however, of the oscillating rather than the vertically reciprocating type. Consequently, the nozzle openings of such attachments likewise did not at all times make good contact with the surface of the rug or carpet being cleaned, particularly with shag rugs and carpets.

A number of the attachments heretofore developed were also objectionable from a stability standpoint in that, because of the relatively small size of the nozzle body thereof, such attachments were easily tipped over if accidentally bumped or jarred while unsupported.

Accordingly, it is a general object of the invention to provide a novel and improved cleaning nozzle attachment which overcomes the aforementioned disadvantages and objections.

Another object is to provide a novel cleaning nozzle attachment of the type that is adapted to be manipulated over a rug or carpet by one or more connected tubular wands, wherein the attachment is substantially free of any downward component of the thrust force

applied to the wands to manipulate the attachment over the surface of a rug or carpet to be cleaned.

A more particular object is to provide a novel cleaning nozzle attachment of the character described, wherein a lost motion connection is provided between the body of the attachment and a wand-receiving socket member thereof so that the entire nozzle body is free to float on the surface of a rug or carpet being cleaned.

A further object is to provide a novel cleaning nozzle attachment of the character described, wherein a novel mechanism is employed for positively extending a pair of wheels at the rear of the nozzle body to a predetermined lowered position with respect to the underside of the nozzle body when the wand receiving socket of the attachment is swung to an upright position so that the attachment is stable while resting on a supporting surface.

Other objects and advantages of the invention will become apparent from the following detailed description and accompanying sheets of drawings, in which:

FIG. 1 is a perspective view of a cleaning nozzle attachment embodying the features of the present invention and showing the latter as it would appear when connected to the suction inlet of an associated canister-type suction cleaner by a plurality of connected tubular wands and a length of flexible hose;

FIG. 2 is a side elevational view of the attachment and connected wand sections shown in FIG. 1, and showing, in broken lines, the approximate position that the wheels at the rear of the attachment and the wand socket member thereof would occupy when the attachment is in use;

FIG. 3 is an enlarged transverse sectional view taken along the line 3—of FIG. 2;

FIG. 4 is a bottom plan view, with most of the base plate thereof broken away to show internal structural details, of the cleaning nozzle attachment illustrated in FIGS. 1 and 2;

FIG. 5 is a longitudinal sectional view taken along the line 5—5 of FIG. 4;

FIG. 5a is a fragmentary, longitudinal sectional view, similar to FIG. 5 but with portions of the attachment removed, showing additional structural details of the wheel extending mechanism;

FIG. 6 is a fragmentary, longitudinal sectional view taken along the line 6—6 of FIG. 4;

FIG. 7 is a rear elevational view, with portions broken away to show internal details, of the attachment illustrated in FIGS. 1, 2 and 4;

FIG. 8 is a longitudinal sectional view, similar to FIG. 5, showing an alternate construction of the mechanism of the attachment for extending the wheels to a lowered position which stabilizes the attachment when the wands and wand socket are pivoted to an upright position;

FIG. 9 is a fragmentary longitudinal sectional view, similar to FIG. 8 but with portions of the attachment removed, showing additional structural details of the wheel extending mechanism;

FIG. 10 is a fragmentary bottom plan view of the portion of the nozzle attachment shown in FIG. 9;

FIG. 11 is a fragmentary bottom plan view, similar to FIG. 10, showing an alternate cross sectional shape for the guideways of the attachment;

FIG. 12 is a horizontal sectional view, with a portion thereof in elevation, through one of the wheels and an alternate guide construction of the attachment; and

FIG. 13 is an end view of the guide illustrated in FIG. 12.

Briefly described, the present invention contemplates a novel cleaning nozzle attachment or accessory tool, which is primarily adapted for use with a canister-type suction cleaner, although it is also suited for use with the so-called central or built-in type systems. Such attachment, to be hereinafter described in detail, includes a nozzle body having a suction opening in the underside thereof adjacent to the front end of the body, and a hollow socket member that is centrally pivotally mounted at the rear of the body. The socket member communicates with the suction opening in the underside of the body and has a tubular portion for receiving one end of a plurality of connected tubular wands. Agitating means in the form of an electric motor-driven brush roll, is rotatably mounted in a chamber in the body above the suction opening and is operable when driven to impart a beating and brushing action to the rug or carpet being cleaned.

In order to permit the nozzle body to float on and thus assume an optimum position with respect to the surface of the rug or carpet being cleaned, a lost motion connection is provided between the nozzle body and the wand socket member. Such lost motion connection includes at least one and preferably a pair of vertically extending, transversely spaced guideways in the nozzle body for slidably receiving the end portions of an axle mounted in the body. Bearing means are mounted on the end portions of the axle and are vertically shiftable in the guideways. A pair of wheels are also mounted on the axle between the socket member and the guideways. In one embodiment, the guideways are substantially circular in cross section and the bearing means comprise substantially spherical guides. Consequently, the axle may rock in a transverse plane through the guideways. In another embodiment, the guideways are non-circular in cross section and the bearing means comprise disks having substantially the same cross sectional shape as the guideways. Consequently, in this embodiment, little or no rocking movement of the axle can occur in the plane of the guideways.

The downward component of the thrust force applied to the wands by a user is prevented from being applied to the nozzle body by locating the axle on the socket member so that the axis of the axle is substantially intersected by the axis of the connected wands.

The nozzle attachment, to be hereinafter described in detail, also includes mechanism for extending the wheels to a lowered position with respect to the underside of the nozzle body when the wands and wand socket member are pivoted to a substantially upright position. Such mechanisms includes at least one ramp carried by the nozzle body and at least one abutment carried by the socket member and movable into engagement with the ramp as the socket member is pivoted to an upright position. Releasable retaining means is also provided for releasably retaining the wheels in the lowered position. In one embodiment, the releasable retaining means comprises a depression in the ramp and spring means for engaging and biasing the abutment into the depression. In another embodiment,

the releasable retaining means comprises a shoulder on the ramp.

In FIG. 1, a rug and carpet cleaning nozzle attachment embodying the features of the present invention is illustrated and indicated generally at 20. In the illustrated arrangement, the attachment 20 is shown connected to a canister-type suction cleaner 21 and will be described hereinafter in connection with such cleaner. It should be understood however, that the attachment 20 could also be used with some other suitable source of vacuum, such as a central or built-in cleaning system.

In order to facilitate manipulation of the attachment 20 over the surface of a rug or carpet to be cleaned, the lower end of at least one and, in the present instance, a pair of connected tubular wands 22 and 23, is connected to the tubular portion 24 of the socket member 25 that is novably mounted in the attachment 20. One end, indicated at 26, of a length of flexible hose 27 is shown connected to the upper end of the connected wands 22 and 23, and the opposite end, indicated at 28, of the hose is shown connected to the inlet of the cleaner 21.

Referring now to FIGS. 2, 4 and 5 in conjunction with FIG. 1, it will be seen that the attachment 20 comprises a generally box-like housing or body 36 having a transverse dimension that is approximately twice as great as its longitudinal dimension. As used herein the terms "longitudinal" and "transverse" relate to the normal direction of movement of the housing 36 over a rug or carpet when the attachment is in use, i.e. forward and backward movements of the attachment would be in a "longitudinal" direction and sideways movements of the attachment would be in a "transverse" direction. A base plate 37 is detachably secured to the underside of the body 36 and is provided with an elongated aperture or suction opening 38 therein adjacent the front end, indicated at 42, of the housing and extending transversely with respect thereto. As will be described more fully hereinafter, the socket member 25 is centrally mounted in the nozzle body 36 adjacent the rear end, indicated at 33, thereof. A brush roll 43 having beater and brush elements, respectively indicated at 40 and 41, thereon, is rotatably mounted in a chamber 44 in the housing 36 so as to communicate with the opening 38 and to exert a beating and sweeping action on the surface of a rug or carpet underlying the opening 38 when the attachment is in use. A central outlet port 46 is formed in a rear wall 47 of the chamber 44, and a length of flexible hose 48 connects the port 46 with the inclined inner head, indicated at 52 in FIG. 5, of the tubular portion 24 of the wand socket member 25. Thus, suction at the inlet of the cleaner 21, or from some other source, is communicated through the wands 22 and 23 to the chamber 44 and hence to the suction opening 38 of the attachment 20.

In order to effect rotation of the brush roll 43, drive means in the form of an electric motor 53 (FIG. 4) is mounted in the housing 36, and the output shaft thereof, indicated at 54, is connected to the brush roll 43 by a belt 56 which extends around the shaft 54 and a pulley 57 connected to the brush roll 43.

Power is supplied to the electric motor 53 through a length of two or three conductor electrical cord 58 (FIGS. 1, 2 and 4), which may be terminated either with a standard two or three conductor plug which will connect to a standard 120 volt A.C. wall outlet or may

be terminated with a special use two or three conductor plug 66 which will allow the unit to be attached electrically to only a special use mating receptacle 59 mounted in the canister housing, indicated at 55, of the cleaner 21. The receptacle 59 is internally connected to the line cord, indicated at 60, of the cleaner 21, and power to the receptacle 59 may be controlled by the same switch (not shown) that controls the operation of the cleaner 21. The latter switch may be controlled by a foot-actuated treadle 61 at one end of the cleaner.

When the attachment 20 is receiving power from the receptacle 59, the plug 66 is connected to a receptacle (not shown) in the end 26 of the flexible suction hose 27. Electrical conductors (not shown) extend throughout the length of the hose 27 and are preferably integrated into the reinforcing structure thereof.

The electrical conductors in the hose 27 emerge from a boss 67 thereon adjacent the cleaner end 28 thereof as a separate wire 68 having a plug 72 at the end thereof. The plug 72 may be a standard two or three conductor plug which may be directly connected to a conventional 120 volt A.C. wall outlet or it may be a special use two or three conductor plug, which will only allow connection to a mating special use receptacle on the canister housing. The flow of current to the receptacle 59 and hence to the plug 72 and electrical motor 53 of the attachment 20, is controlled by the same switch that controls the operation of the cleaner 21.

In the interests of safety and in order to improve the appearance of the attachment 20 when the latter is receiving power from the receptacle 59, the cord 58 is preferably enclosed in a channel 63 (FIGS. 1, 2 and 3), which extends along the connected wands 22 and 23 and which is releasably secured thereto as by releasable metal clips 64.

In order to prevent any downward thrust components from being applied to the body 36 of the attachment 20 when the latter is in use and to permit the body to float on the surface of a rug or carpet being cleaned and thus assume an optimum cleaning position with respect thereto, a novel lost motion connection is provided between the socket member 25 and nozzle body 36. Such lost motion connection, in the present instance, comprises an axle 73 (FIGS. 4-7, inclusive) which is carried in a transversely extending bore 74 in a generally cylindrical boss 76 formed integrally with the socket member 25. The bore 74 and boss 76 are located so that the axis of the axle 73 is substantially intersected by the axis of the tubular portion 24 of the socket member 25 are hence by the axis of the connected wands 22 and 23.

Rug and carpet engaging means comprising at least one and preferably a pair of wheels, respectively indicated at 77 and 78, are rotatably mounted on the axle 73 adjacent the boss portion 76 of the socket member 25. Each of the wheels 77 and 78 has an enlarged hub 79, and the axial end faces of each hub 79 serve as bearing surfaces for the wheels.

The outer ends, indicated at 81 and 82 in FIG. 7, of the axle 73 adjacent the wheels 77 and 78, respectively, extend through a pair of vertical slots 84 in a pair of transversely spaced, longitudinally extending wall sections 86 (FIG. 4) of the housing 36, and into a pair of substantially vertically extending guideways 87 and 88 (FIGS. 4, 6 and 7) formed in enlarged bosses 92 on the laterally outer sides of the wall portions 86. The guideways 87 and 88 are circular in cross section and are of

a length substantially equal to that of the vertical height of the housing 36 (FIG. 6). Movement of the ends 81 and 82 of the axle 73 in the guideways 87 and 88 is provided for by bearing means in the form of a pair of spherical guides 93 and 94, which are respectively mounted on the ends 81 and 82 of the axle and which are axially shiftable on said ends. Thus, the guides 93 and 94, control movements of the axle 73 in a substantially vertical plane passing through the slots 84 and guideways 87 and 88 and, because of their spherical form, permit the axle 73 to rock to limited extent in the aforementioned plane. The guides 93 and 94 are retained in the guideways 87 and 88 by a pair of retainers 96, which may be removably secured to the bosses 92 as by screws 97.

With the foregoing construction, it will be apparent that when the attachment 20 is in use and is being manipulated over the surface of a rug or carpet by the wands 22 and 23, the nozzle body 36 is free to rise and fall on the surface of the rug or carpet being cleaned with changes in the thickness or resiliency of the pile of the rug or carpet due to the lost motion connection between the nozzle body 36 and socket member 25. In other words, since the guides 93 and 94 are freely vertically movable in the guideways 87 and 88, the nozzle body 36 is likewise free to move vertically relative to the wheels 77 and 78 as the attachment is manipulated over the surface of a rug or carpet being cleaned. Consequently, the housing 36 will bodily "float" on the surface of a rug or the pile of a carpet being cleaned and is easily pushed or manipulated on the rug or carpet. In addition, since the axle 73 is located in the socket member 25 so that the wheel axis is substantially intersected by the axis of the connected wands 22 and 23, the downward component of the thrust force exerted on the wands is prevented from being applied to the nozzle body 36. Moreover, since the guides 93 and 94 will accommodate a limited amount of rocking movement of the axle 73 in the plane of the guideways 87 and 88, the nozzle body 36 will adapt itself to any irregularities in the surface of the rug or carpet being cleaned so that an optimum cleaning action is at all times obtained. In FIG. 7, the axle 73, guide 93, and wheels 77 and 78 of the attachment 20 are shown in broken lines in the positions they might occupy when the nozzle body 36 is traversing a rug or carpet having an irregular surface so that the axle is caused to rock in the plane of the guideways 82 and 87. The aforementioned broken line positions of the axle 73, guide 93, and wheels 77 and 78 are respectively indicated at 73', 93', 77' and 78' in FIG. 7.

In order to improve the stability of the attachment 20 if a user's grip on the wands 22 and 23 should be released when the latter are in their upright position illustrated in FIGS. 1 and 2 and the hose 27 is connected to the wands and to prevent deformation of the bristles 41 on the brush roll 43 when the attachment is in storage or resting on a hard surface, the attachment includes mechanism, indicated generally at 100 in FIG. 5, for extending the wheels 77 and 78 to a predetermined lowered position with respect to the underside of the nozzle body 36. The mechanism 100 thus comprises at least one and preferably a pair of transversely spaced ramps 103 and 104 (FIGS. 5a and 7) carried on the underside of the top wall of the housing 36, and a pair of abutments in the form of a pair of transversely

outwardly extending, coaxial pins or trunions 105 and 106 on the socket member 25.

The ramps 103 and 104 have inclined surfaces 110 which respectively coact with the pins 105 and 106 to exert a downward force on the socket member 25 as the tubular portion 24 thereof is swung to an upright position by the wands 22 and 23. Thus, when the tubular portion 24 of the socket member 25 is in its upright inoperative position illustrated in FIGS. 1, 2 and 5, the wheels 77 and 78 will be positively shifted to their lowermost or fully downwardly extended position, as shown in full lines in FIGS. 2 and 5. Consequently, the rear end 33 of the nozzle body 36 is elevated sufficiently so that when the body 36 is resting on a horizontal surface, represented by the line 111 in FIG. 2, it will be supported on such surface by the wheels 77 and 78 and by the front edge, indicated at 112 in FIGS. 2, 4 and 5, of the base plate 37. When so supported, the attachment 20 is stable and rests on a substantially triangularly-shaped base. The attachment is therefore less likely to be accidentally knocked over than if the wheels 77 and 78 were not extended and, because the rear end of the body 36 is elevated when the wheels are extended, the bristles on the brush roll 43 are prevented from contacting and being deformed by a hard surface.

In order to prevent undesired retraction on the wheels 77 and 78 due to accidental bumping or jarring of the wands 22 and 23 when the latter are in their upright position illustrated in full lines in FIGS. 2 and 5, releasable retaining means, indicated generally at 115 in FIG. 5, is provided for releasably retaining the pins 105 and 106 in a predetermined position on the ramps 103 and 104 corresponding to the extended or lowered position of the wheels 77 and 78. Such releasable retaining means preferably comprises at least one and preferably a pair of recesses 116 in the inclined surfaces 110 of the ramps 103 and 104 for respectively receiving the pins 105 and 106 when the pins have moved to a position on the ramps corresponding to the fully extended position of the wheels 77 and 78. Spring means in the form of a pair of resilient arms 117 (FIGS. 4 and 5) are each secured at one end as by screws 118 to the housing 36 so that the free ends, indicated at 119, of the arms will engage and urge the pins 105 and 106 into the recesses 116. Thus, the recesses 116 and resilient arms 117 coact to releasably retain the pins 105 and 106 in the predetermined positions on the ramps 103 and 104 when the tubular portion 24 of the socket member 25 and the wands 22 and 23, are pivoted fully to their upright, full-line positions illustrated in FIGS. 1, 2 and 5.

When it is desired to disengage the pins 105 and 106 from the inclined surfaces 110 of the ramps 103 and 104 so that the wheels 77 and 78 are free to move relative to the housing 36 and the latter is thereby free to float on the surface of a rug or carpet being cleaned, a user need only pivot the wands 22 and 23 away from the upright, full-line position thereof illustrated in FIGS. 1, 2 and 5 to or beyond the inclined broken line position 24' of the tubular portion illustrated in FIGS. 2 and 5. Thus, as the tubular portion 24 of the socket member 25 is moved away from its upright position toward the aforementioned broken-line position 24', the pins 105 and 106 move out of the recesses 116 and then separate from the ramp surfaces 110. The disengaged position of the pin 106 from the ramp surface

110, corresponding to the inclined position 24' of the tubular portion of the socket member 25, is shown in broken lines in FIG. 5 and indicated at 106'.

Referring now to FIGS. 8, 9 and 10, an alternate construction is illustrated and indicated generally at 125, for the releasable retaining means 115 shown in FIG. 5. The releasable retaining means 125 comprises at least one and preferably a pair of shoulders or flat portions 126 (FIGS. 8, 9 and 10) on the ramps 103 and 104, at one end of the inclined surfaces 110, the pins 105 and 106 being movable onto the surfaces 110 as the tubular portion 24 of the socket member 25 is pivoted to its upright, full-line position illustrated in FIG. 8. Thus, when the pins 105 and 106 are engaged with the shoulders 126, the pins 105 and 106 will be frictionally and hence releasably retained in a predetermined position on the ramps 103 and 104 corresponding to the fully extended or lowered position of the wheels 77 and 78.

When it is desired to disengage the pins 105 and 106 from the shoulders 126 and inclined surfaces 110 so that the wheels 77 and 78 are free to move relative to the housing 36, a user need only pivot the wands 22 and 23, and consequently the tubular portion 24 of the socket member 25, away from the upright positions thereof illustrated in full lines in FIG. 8 until the tubular portion 24 reaches or moves beyond the inclined, broken line position 24' thereof. The pins 105 and 106 will then be separated from the ramps surfaces 110, and housing 36 will be free to move relative to the wheels 77 and 78 and float on the surface of a rug or carpet being cleaned.

Referring now to FIGS. 11-13, inclusive, an alternate guideway and bearing construction is illustrated, for guiding movements of the axle 73 with respect to the housing 36. Since the alternative construction is symmetrical, only the portion thereof adjacent to the right end of the axle, as viewed in FIG. 4, has been illustrated in FIG. 11. The guideway, indicated at 131 in FIG. 11, is similar to the guideway 87 shown in FIGS. 4-7 in that the former is also formed in an enlarged boss 132 on the laterally outer side of the housing wall portion 86. The guideway 131 differs from the guideway 87 in that the former is rectangular, rather than circular, in cross section. In addition, the bearing means, which is movable in the guideway 131, is likewise rectangular in cross section and closely fits the interior of the guideway 131. Specifically, the bearing means is in the form of a disk-like guide 133 having a diameter substantially equal to the longitudinal dimension of the guideway 131 and a thickness equal to the transverse dimension of the guideway 131. Thus, when a pair of the guideways 131 are employed in the housing 36 and a pair of the guides 133 are mounted on the ends of the axle 73 and disposed in the guideways 131, the axle 73 is incapable of any significant amount of rocking movement with respect to the housing 36. Consequently, the attachment 20 will exhibit handling characteristics similar to that of a conventional upright cleaner.

We claim:

1. In a rug and carpet cleaning nozzle attachment adapted to be connected to a source of vacuum and to be manipulated over a rug or carpet to be cleaned by at least one tubular wand, said attachment including a nozzle body having front and rear ends extending generally transversely to the axis of said wand and an underside having a suction opening therein, said nozzle body

also having a socket member movably mounted therein adjacent to said rear end and a tubular portion adapted to receive one end of said wand, and at least one wheel rotatably carried by said socket member and adapted to roll on a rug or carpet to be cleaned when said attachment is in use, the improvement comprising mechanism for extending said wheel to a predetermined lowered position below the underside of said nozzle body in response to movement of the tubular portion of said socket member to an upright position with respect to said body, whereby the rear end of said body is elevated and said body is supported in a stable condition on said rug or carpet by said wheel and the front end of said body.

2. The attachment of claim 1, further characterized in that said wheel extending mechanism comprises at least one ramp on said nozzle body, and at least one abutment on said socket member and movable into engagement with said ramp as said socket member is moved toward said upright position.

3. The attachment of claim 2 further characterized in that a transversely spaced pair of said ramps are provided on said nozzle body, and a transversely spaced pair of said abutments are provided on said socket member.

4. The attachment of claim 3, further characterized in that said abutments comprise a pair of pins extending transversely outwardly from the opposite respective sides of said socket member.

5. The attachment of claim 2, including means for releasably retaining said abutment in a predetermined position on said ramp corresponding to the extended position of said wheel.

6. The attachment of claim 5, further characterized in that said releasable retaining means comprises a de-

pression in said ramp for receiving said abutment, and spring means engageable with said abutment and operable to bias said abutment into said depression.

7. The attachment of claim 6, further characterized in that said spring means comprises a resilient arm having one end secured to said nozzle body and the opposite end thereof disposed in the path of movement of said abutment so as to engage the latter as said abutment moves into said depression.

8. The attachment of claim 5, further characterized in that said releasable retaining means comprises a shoulder on said ramp.

9. The attachment of claim 1 further characterized in that a transversely spaced pair of said wheels are mounted on said socket member and respectively disposed on opposite sides thereof.

10. The attachment of claim 1, further characterized in that at least the front end of said nozzle body is transversely elongated, and said socket member is located substantially centrally of said rear end, whereby said nozzle body is supported on a substantially triangularly-shaped base when said socket member is in said upright position.

11. The attachment of claim 1, further characterized in that said nozzle body has a chamber therein communicating with said suction opening, a brush roll having a plurality of radially outwardly extending bristles thereon is rotatably mounted in said chamber and operable when driven to agitate the surface of a rug or carpet underlying said suction opening, and said wheel extending means is effective to elevate said nozzle body sufficiently so as to prevent said bristles from contacting the surface of said rug or carpet when said socket member is in said upright position.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 3,908,223

DATED : September 30, 1975

INVENTOR(S) : Joseph F. Brooks, et al

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Col. 1, line 14, "Vermeulen" should read --both--; line 27, "Vermeulenn" should read --Vermeulen--; line 30, "provided" should read --proved--; line 46, "hurd" should read --Hurd--.

Col. 2, line 36, after the hyphen "(-)" should appear --3--; line 53, "FIJG." should read --FIG.--.

Col. 4, line 18, "novably" should read --movably--.

Col. 7, line 32, "ijn" should read --in--.

Col. 8, line 37, "alternative" should read --alternate--; line 66, "etending" should read --extending--.

Signed and Sealed this

twenty-third Day of March 1976

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks