

[54] **TOOL STORAGE RACK**  
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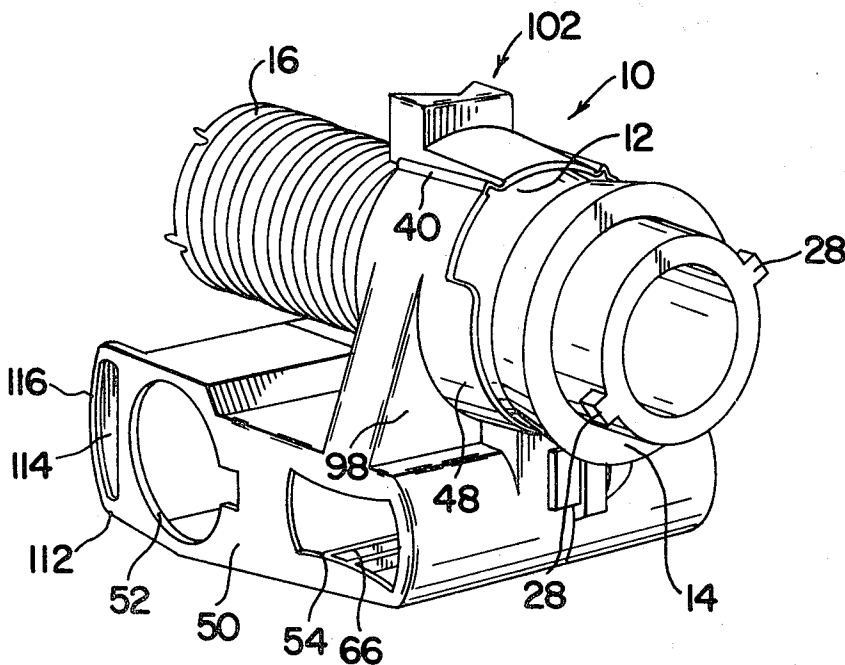
[52] **U.S. Cl.**..... 15/323, 15/257 A, 24/255 SL, 211/118, 248/231, 248/313  
 [51] **Int. Cl.**..... **A47I 9/00**  
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[57] **ABSTRACT**

A tool storage rack for cleaning tools utilizable with a suction hose for a vacuum cleaner is provided which is attached to the cleaner end of the suction hose so as to make the tools readily available to the user when needed. The tool storage rack includes sockets for the easy mounting and dismounting of the tools and a hook means for use in hanging the tool holder with attached suction hose and tools on the wall of a closet or the like when they are not in use.

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**15 Claims, 15 Drawing Figures**



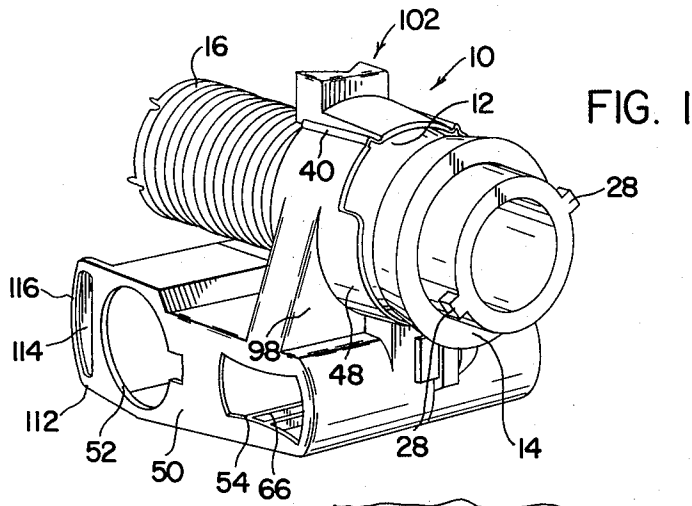
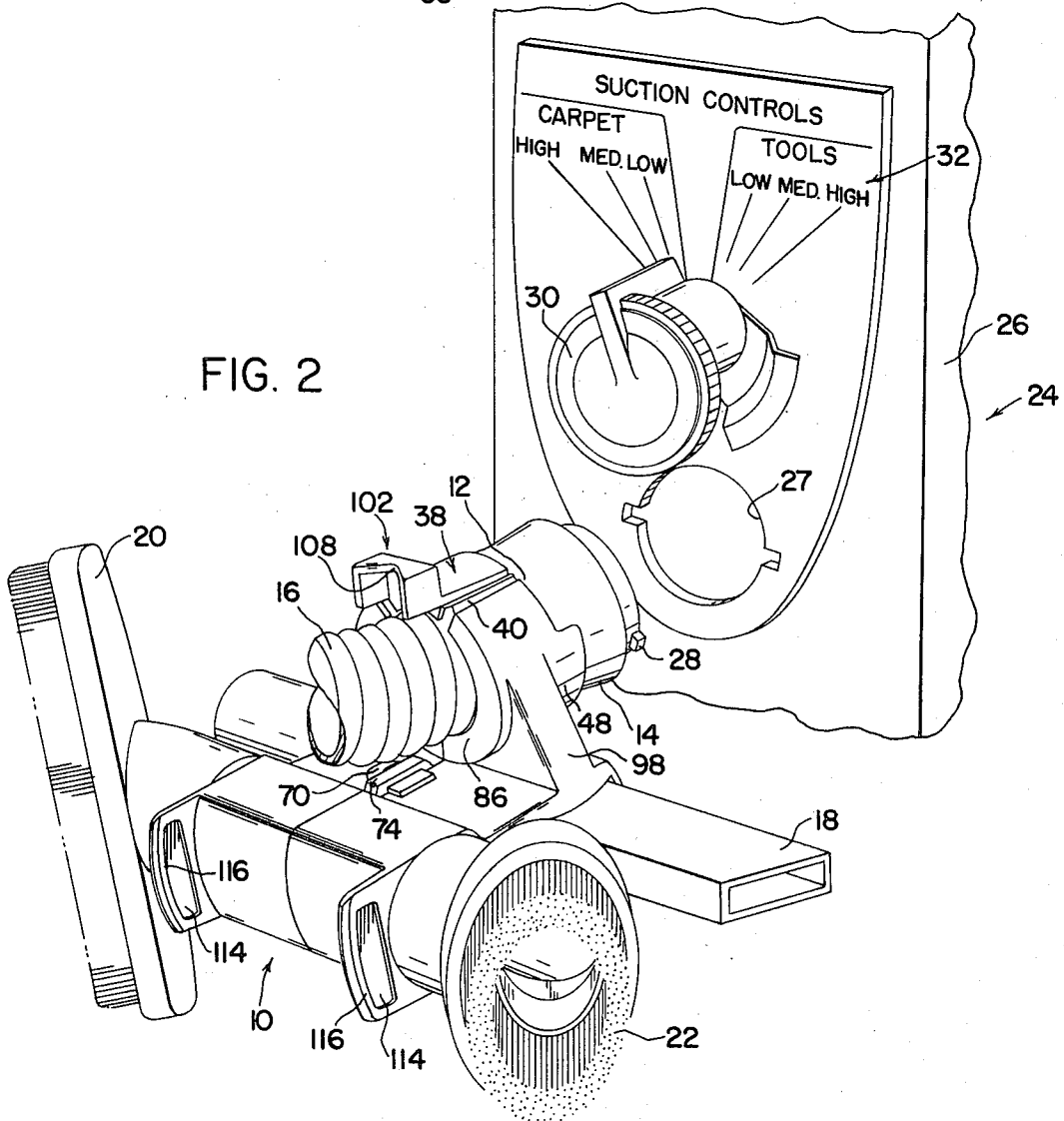


FIG. 1

FIG. 2



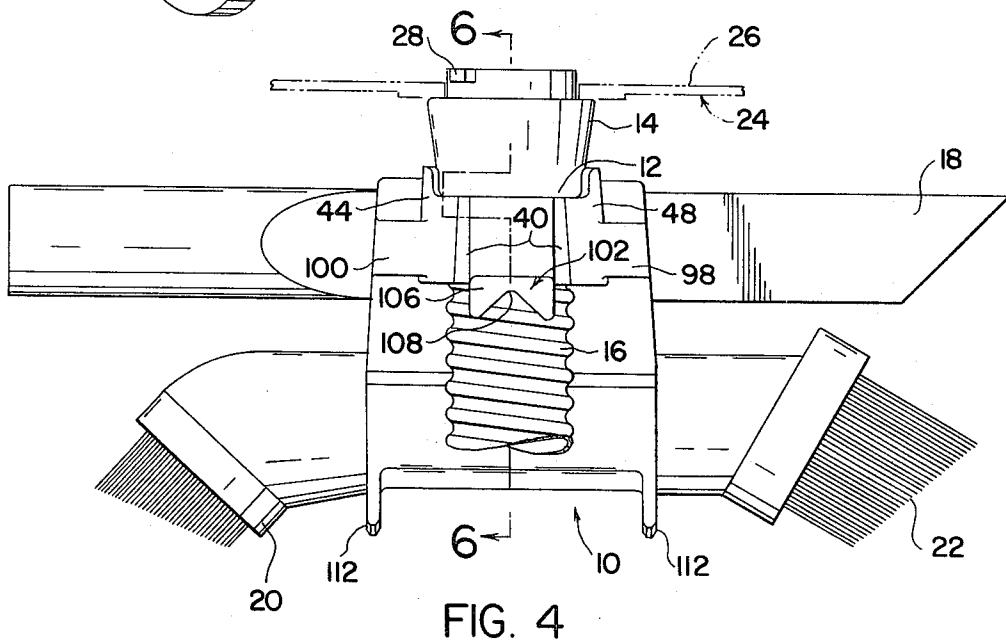
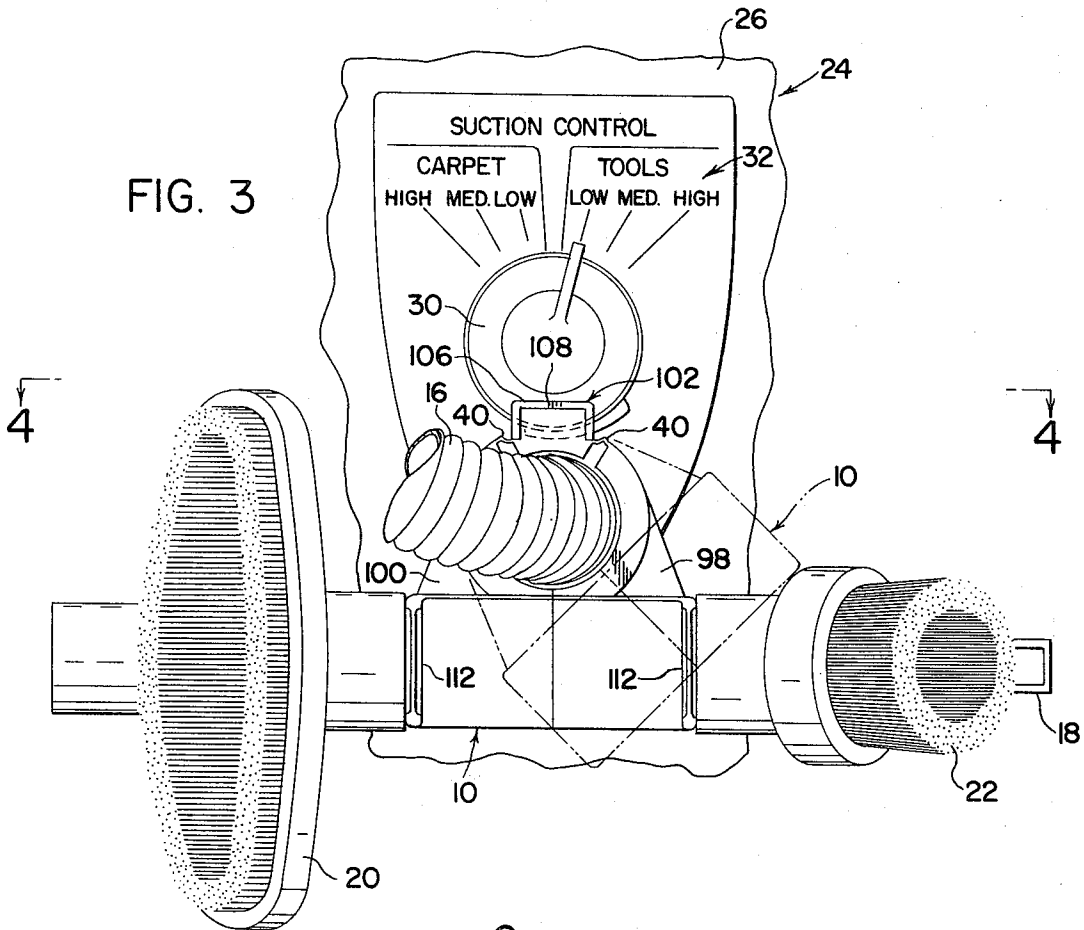


FIG. 5

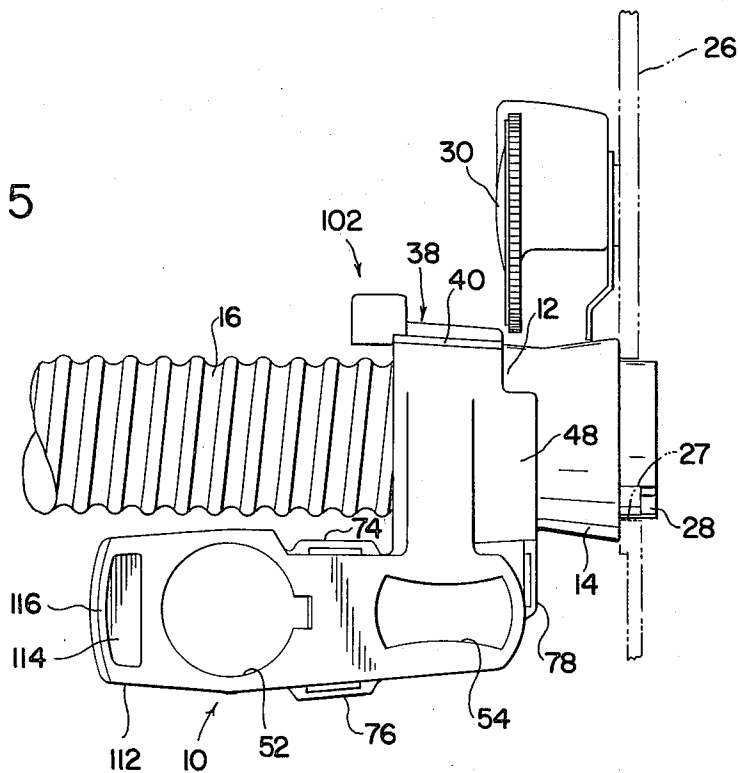
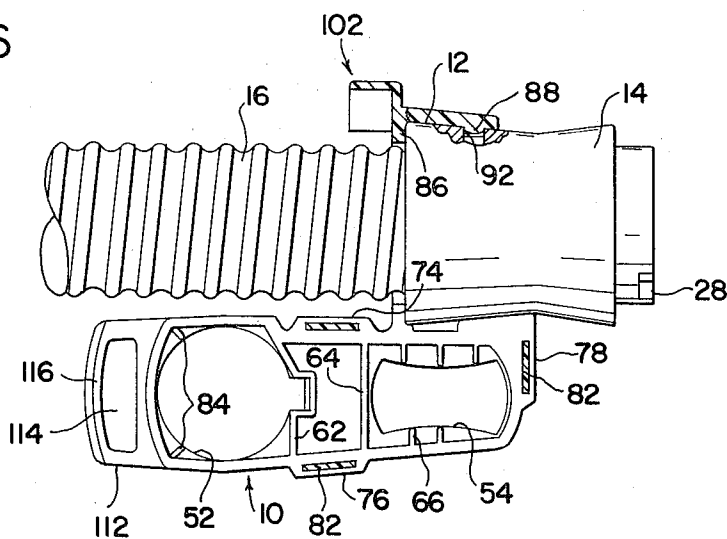
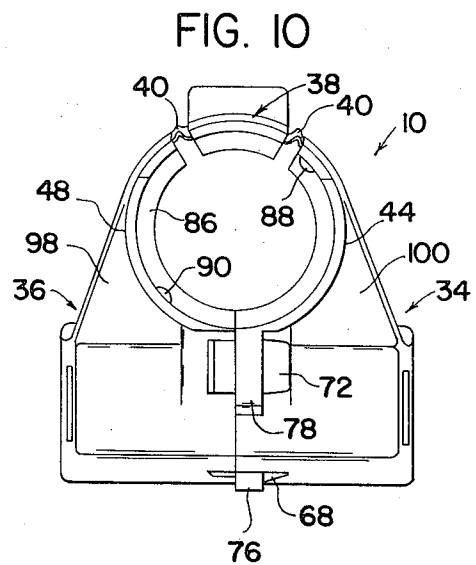
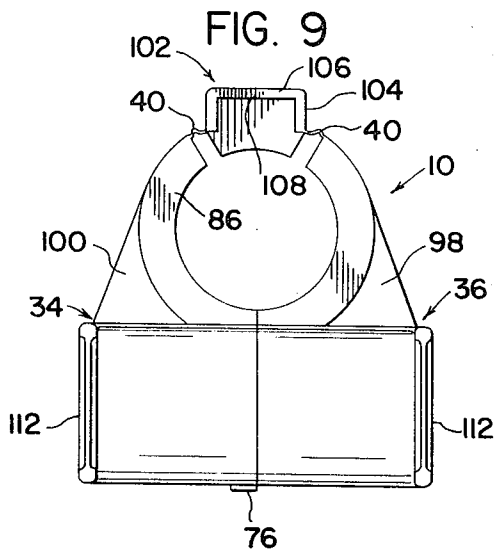
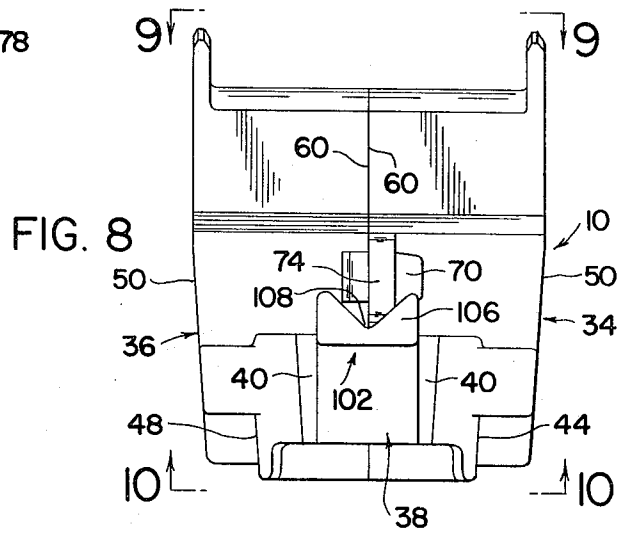
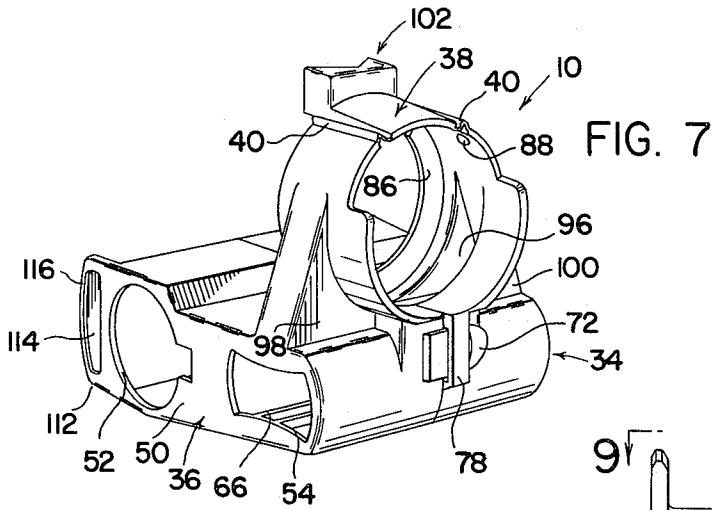
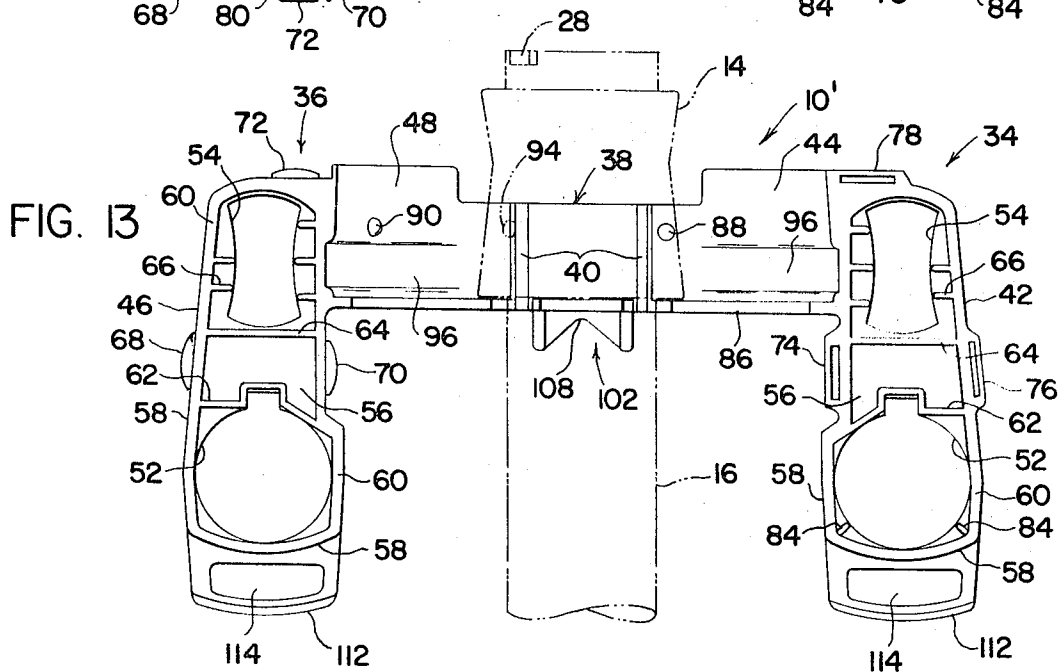
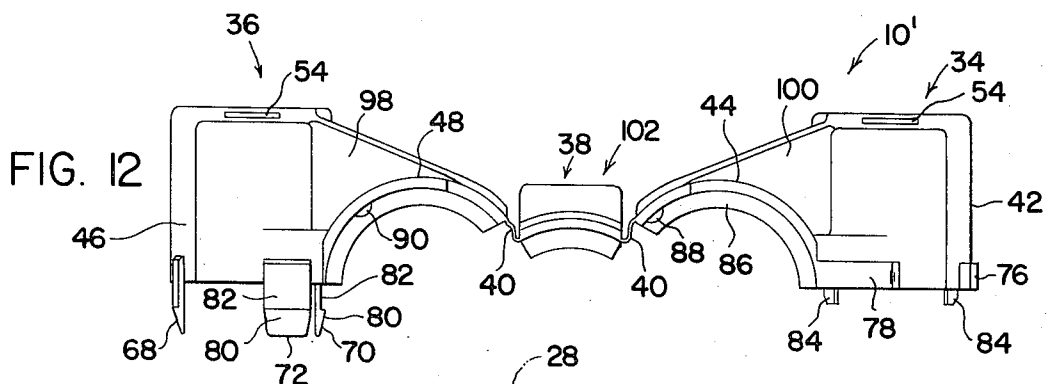
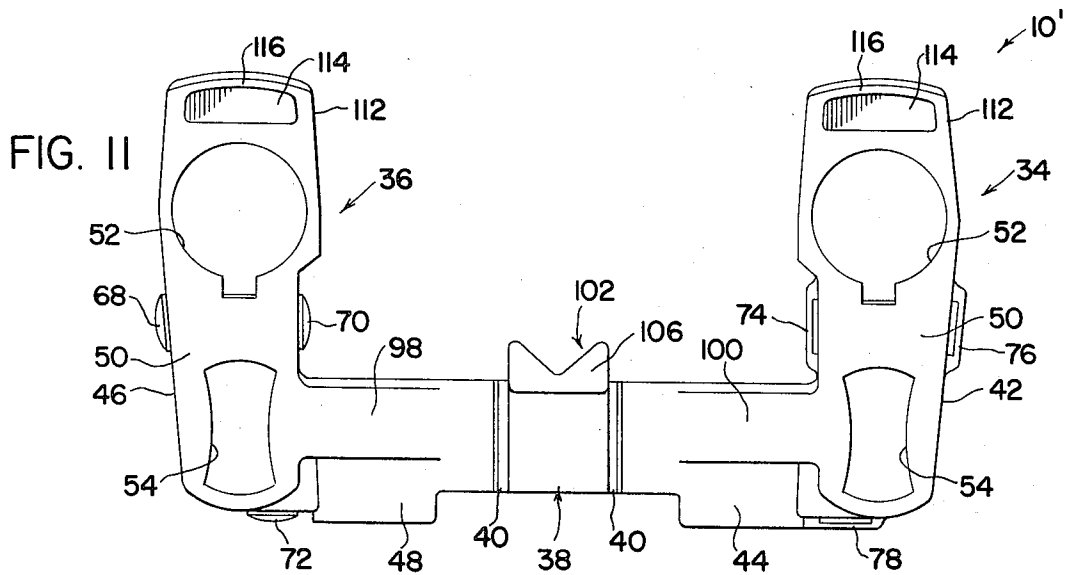


FIG. 6







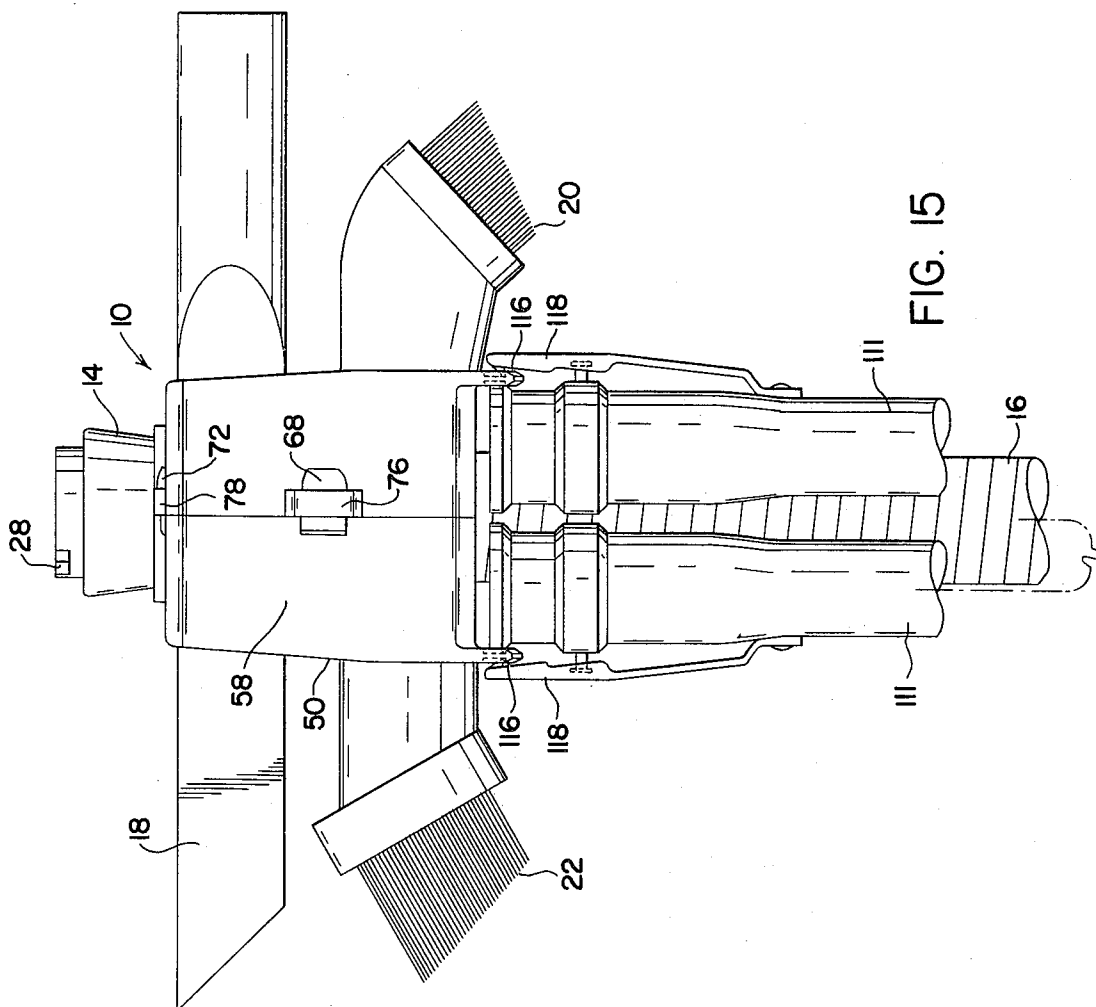


FIG. 15

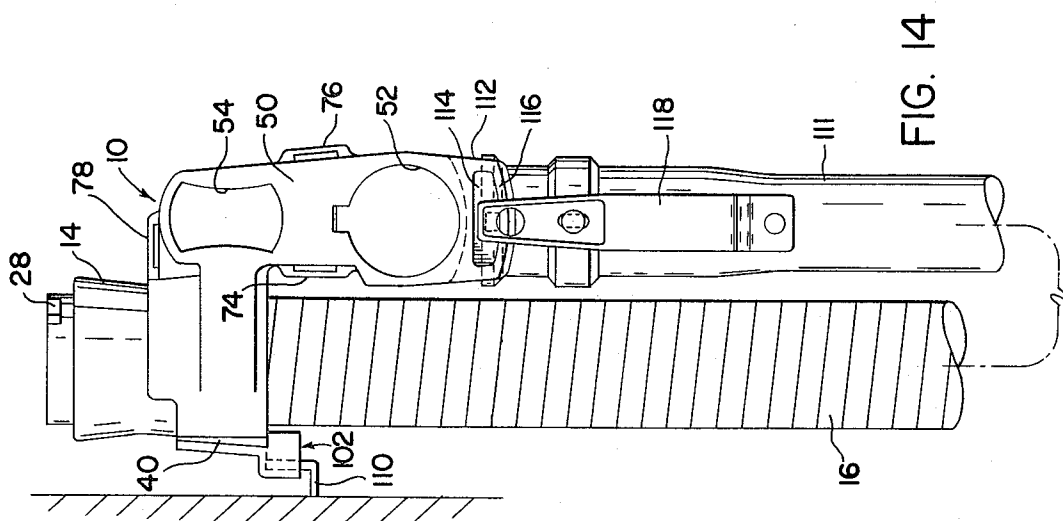


FIG. 14

## TOOL STORAGE RACK

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

This invention relates, generally, to floor care appliances and, more specifically, relates to tool storage racks for mounting cleaning tools utilizable with a vacuum cleaner.

#### 2. Description of the Prior Art

The use of tool storage racks, caddies, and supports in the floor care appliance field has been known for a large number of years. These tool storage means have taken a variety of forms, some mountable only independently of the vacuum cleaner, on a wall or in a closet or the like; some mountable on the vacuum cleaner itself, and some mountable both on and off the vacuum cleaner, dependent upon the whim or wish of the user. Of course, these last mentioned tool supports provide for greater flexibility for the user because of their adaptability to a variety of user situations. Thus, a tool storage rack having this versatility appears to be most advantageous in furthering housewife cleaning effort.

Some of these last mentioned tool supports are designed specifically for mounting only on one type of vacuum cleaner such as a canister type. Obviously, then, when this type is utilized on the canister cleaner, tools are readily available for use on the end of the suction hose at all times. However, this type of tool rack is not easily adaptable to, say, a conventional, convertible cleaner since this cleaner generally takes an upright form with some means for providing conversion to hose operation.

Although tool supports utilizable with and mounted on an upright cleaner might be adaptable for support of the tools utilized with a convertible cleaner, these tools are only needed after conversion. Thus, tool support arrangement would be superfluous at all times save during the hose conversion mode of the suction cleaner so that provision should be made for the rapid dismounting thereof during floor cleaning and the rapid remounting thereof during hose conversion.

Accordingly, it would be advantageous to provide a tool support for a convertible cleaner which was adapted for easy fixed mounting on the cleaner during the hose conversion mode.

It would be additionally advantageous to structure the tool rack to make for easy dismounting of the same from the cleaner when it was used in on-the-floor operation.

It would be still further advantageous to mount such a tool support with the conversion hose so that they could be moved as a unit, semiautomatically necessitating the inclusion of the mounted tools in a package readily accessible to the convertible cleaner during its conversion mode.

Further, since the hose and tool support would be mounted as a unit for ease in conversion, it would be advantageous to utilize the tool support as a suspension means for the hose while the same was to be placed in an out-of-the-way storage location.

### SUMMARY OF THE INVENTION

In accordance with the principles of the invention, a tool storage rack for the receptive mounting of tools such as, e.g., a crevice nozzle and an upholstery brush is provided. This tool storage rack is made from plastic

so as to be easily molded and is in a somewhat flattened condition, as molded, prior to easy folding encirclement around a conventional hose coupling end of a tool suction hose.

When folded, the tool storage rack provides a slightly tapering bore within which is disposed the hose coupling. As mounted, disposed below the formed bore and outwardly of the cleaner, is a tool holding section formed by two mating, generally rectangular tubular portions. Each tubular portion has a pair of mating irregular passageways, within which are inserted the cleaning tools when attached to the tool storage rack. A series of mating, engaging tabs and loops, formed so as to be in opposed relation on the mating halves of the tool storage rack, insure retention of the tool storage rack in its folded, mounted position of the hose end coupling.

A V-shaped groove, formed with the apex of the V-shaped groove oriented axially relative to the elongated length of the suction hose, is included as an integral element of the tool storage rack. This V-shaped groove conveniently serves as a hook to suspend the tool storage rack and attached suction hose when the same are in an inactive, storage position.

### DESCRIPTION OF THE DRAWINGS

Reference may now be had to the appended drawings for a better understanding of the invention, both as to its organization and function, with the illustration being only exemplary and in which;

FIG. 1 is a perspective view of the invention;

FIG. 2 is a perspective view of the invention with mounted tools and located in close adjacency to a convertible cleaner housing;

FIG. 3 is a front elevation of the invention, with mounted tools, and shown attached to a convertible cleaner housing;

FIG. 4 is a top plan view of the structure illustrated in FIG. 3;

FIG. 5 is a side elevational view of the structure illustrated in FIGS. 3 and 4;

FIG. 6 is a side elevational and partly sectional view of the structure illustrated in FIG. 4 and taken on line 6-6 of FIG. 4;

FIG. 7 is a perspective view of the invention shown removed from the suction hose coupling fitting;

FIG. 8 is a top plan view of the invention as shown in FIG. 7;

FIG. 9 is an end elevational view of the invention taken on line 9-9 of FIG. 8;

FIG. 10 is another end elevational view of the invention but this time taken on line 10-10 of FIG. 8;

FIG. 11 is a top plan view of the invention, as molded, prior to folding;

FIG. 12 is a front elevational view of the structure illustrated in FIG. 11;

FIG. 13 is a top plan view of the bottom side of the invention and showing its relationship to the hose coupling immediately prior to folding conformance therewith;

FIG. 14 is a side elevational view of the invention and assembled hose disposed in a stored condition; and

FIG. 15 is a front elevational view of the structure illustrated in FIG. 14.



### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Turning now to FIGS. 1 to 6 of the drawings, it can be seen that a tool storage rack 10 is mounted and envelopes a tapered portion 12 of a generally tubular hose fitting 14. The tubular hose fitting is, in turn, conventionally connected to one end of a tool suction hose 16, by any standard means (not shown), the other end of the tool suction hose (also not shown) providing for mounting of conventional cleaning tools such as a crevice tool 18, dusting brush 20 and an upholstery brush 22.

A convertible cleaner 24, shown only fragmentarily as a portion of a housing 26 of the convertible cleaner 24 includes a port 27 that provides sealing connection between hose fitting 14 and the interior of the cleaner 24. Male bayonet members 28, 28 on coupling fitting 14 insure positive engagement of the hose fitting 14 so that sufficient suction is available at the remote end (not shown) of the hose 16, to effectively use the cleaning tools for cleaning purposes.

Conversion of the convertible cleaner 24 from carpet suction to tool suction is occasioned by manual movement of a dial 30 between these modes as indicated by an indices means 32 provided by stamping or printing on the outer face of housing 26. This dial, in movement, actuates a valve (not shown) which directs the suction air stream either through the port 27 or a suction nozzle (not shown) used for carpet suction.

The structure just enumerated in the preceding paragraph is old and well known, being more specifically described in U.S. Pat. No. 3,300,806, issued Jan. 31, 1967, and owned by a common assignee. Reference may now be had to that patent for a more thoroughgoing understanding of a particularized convertible cleaner with which the instant tool storage rack 10 may be utilized. However, it should be noted that the tool storage rack 10 could quite easily be utilized with a variety of other cleaners including, for example, canister-type cleaners.

The tool storage rack 10 in an as molded, prefolded condition (indicated at 10') is illustrated in FIGS. 11 - 13 and includes a pair of substantially mirror image portions 34, 36 which, with a connecting portion 38, go to make up the closed configuration of tool storage rack 10. A pair of integrally connected living hinges 40, 40, one of which is positioned on each side of connection portion 38, connects it to the mirror image portions 34, 36 and permits these three elements to assume the closed configuration illustrated in the other views of the drawings.

Each of the mirror image portions 34, 36 can be considered comprising an integral tool supporting portion and a hose fitting conforming portion extending laterally therefrom. Mirror image portion 34 includes tool supporting portion 42 and hose fitting conforming portion 44. Mirror image portion 36 includes tool supporting portion 46 and hose fitting conforming portion 48. In its final closed configuration, then, tool storage rack 10 mounts its cleaning tools 18, 20 and 22 in the joined tool supporting portions 42 and 46, while the hose fitting conforming portions 44 and 48, along with connection portion 38 envelope hose fitting 14 to maintain tool storage rack 10 in assembled relation with suction hose 16.

Each of the tool supporting portions 42, 46 includes an outer face 50 having a generally round aperture 52 and a partially hour-glass shaped aperture 54 disposed therein. Each of these faces is formed from a thin, outer walled section 56 that is integrally joined to a closed looping (in cross section) transversely, vertically extending wall portion 58 that terminates at its bottom in a rim 60. This rim provides an abutting means for the other contiguous rim 60 on the other respective tool supporting portion when the same is in an assembled relation.

Strengthening ribs, e.g., 62, 64, 66, provided within the closed loop of transversely and vertically extending wall portion 58, are integrally connected to it to extend for its full vertical depth to be integrally connected to thin walled section 56. These strengthening ribs extend vertically a sufficient distance so as to terminate at the same plane as rim 60 and are located, shaped and dimensioned so as to provide no interference with the full insertion of the tools 18, 20 and 22 into the tool storage rack 10.

A series of tabs 68, 70 and 72, provided on tool supporting portion 46, extend outwardly from the rim 60 for locking engagement with a series of ears 74, 76 and 78, respectively, provided on tool supporting portion 42 when the two portions are assembled in abutting relation.

Each of the tabs 68, 70 and 72 includes a cam portion 80 and a locking portion 82, with the termination of the cam portion 80, contiguous to the locking portion 82, being more outwardly disposed than the locking portion 82. The camming portions on the tabs, as can be easily seen, are angled to provide a wedging engagement with the locking ears and a lead-in angle for easy initial inserting engagement with the locking ears. As is conventional in such locking tabs and ears, a snap-over action occurs when the locking portion 82 of each tab comes into engagement with its respective locking ear to securely maintain tool storage rack 10 in assembled condition.

Also, to aid in assembly of the tool storage rack 10, a pair of small ribs 84, 84 extend slightly outwardly of the tool supporting portion 42 beyond the rim 60. These ribs engage against inner corners of the wall portions 58, on tool supporting portion 46, upon initial folding of these two portions together, to thereby align them for final assembly. It should now be clear that the two tool supporting portions 42, 46, interfit by means of their locking tabs and ears to maintain the folded assembly of connecting portion 38 and hose fitting conforming portions 44 and 48 together to form a tubular envelope around hose fitting 14.

Hose fitting 14 is maintained in this envelope in the following manner. The connecting portion 38 and hose fitting conforming portions 44 and 48, as was indicated previously, form a circular configuration when the tool storage rack 10 is in closed condition. A radially inwardly extending, circular flange 86 is formed by these three elements when in closed configuration that extends substantially uninterruptedly around their closed configuration (save for the area of the living hinges). This flange is that part of these three elements which limits axial movement of hose fitting 14 axially outwardly of the formed cylindrical envelope towards tab 70 and ear 74. Hose 16, then, would extend axially outwardly beyond hose fitting 14, past tab 70 and ear 74,

to be connected at its remote end to one of the tools carried by tool storage rack 10 (see FIG. 13).

Axially inwardly of flange 86, the connecting portion 38 and hose conforming portions 44 and 48 lie closely adjacent to the slightly tapering section of hose fitting 14 which they encompass, the width of the connecting portion 36 and hose conforming portions 44 and 48 being sufficient enough so that approximately one-half of the axial length of hose fitting 14 is enveloped by this part of tool storage rack 10.

In order to insure the assembled integrity of tool storage rack 10 and hose fitting 14, tool storage rack 10 includes a pair of integral, rounded, radially inwardly projecting buttons 88, 90. These buttons are disposed in aligned relationship on hose fitting conforming portions 44 and 48, respectively, and spaced on their inner circumferences at locations that place them in diametrically opposed relation (e.g., see FIG. 10) when the tool storage rack 10 has been lockingly assembled so that the locking tabs 68, 70 and 72 lockingly engage with locking ears 74, 76 and 78. In order to provide positive engagement on the hose fitting 14, for the buttons 88, 90, hose fitting 14 includes a pair of diametrically opposed bores 92, 94 of substantially the same diameter as the buttons 88, 90. These bores, of course, receive the projecting buttons when the tool storage rack 10 is mounted on hose fitting 14 to thereby positively locate the hose fitting 14 within the tool storage rack 10.

Strengthening of the tool storage rack 10 is accomplished by a pair of integrally formed, offset portions 96, 96 of tool storage rack 10 that are positioned axially inwardly of the flange 86. The offset portions 96, 96 are somewhat triangular in end view to furnish a substantially deep cross-sectional area and thereby a pair of effective strengthening ribs 98, 100 for bracing and rigidifying purposes of the tool storage rack 10.

The assembly of the tool storage rack 10, the hose fitting 14 and suction hose 16 should now be fairly evident. More specifically, the tool storage rack is placed in an upwardly open position such as shown in FIG. 13, and the hose fitting 14 laid therein, with the terminating end of the hose fitting 14 adjacent the suction hose 16 in abutting relation with flange 86. The bores 92, 94 in the hose fitting 14 are aligned with the projecting buttons 88, 90 of the tool storage rack 10 and the portions of this tool rack extending transversely outwardly from beneath hose fitting 14 folded around the hose fitting. As these transversely extending ends (portions of mirror images 36, 38) come close to abutting contact, the locking tabs 68, 70 and 72 engage with locking ears 74, 76 and 78, respectively, and cam into inserted, locking engagement therewith, with the mirror image portions 36, 38 then in tight abutting engagement.

Assembly is then complete and the tools 18, 20 and 22 may be loaded in storage rack 10 to make a convenient package of the tool hose 16, hose fitting 14, tool storage rack 10 and tools 18, 20 and 22. Thus, whenever the housewife desires to convert her convertible cleaner 24 from carpet cleaning to suction hose operation, she merely goes to a convenient storage location and gets the combined suction hose, tool rack and tools, carries this assemblage to the convertible cleaner, inserts the bayonet end of the hose fitting in the cleaner and moves the conversion valve of the cleaner to tool suction. The cleaner is then fully in the tool suction mode and the tools, moreover, are conveniently lo-

cated at the suction hose end adjacent the cleaner 24.

To add to the convenience of utilization of the tool storage rack 10, a hook means 102 is provided thereon so that the tool rack-suction hose may be easily stored on an out-of-the way wall or in a closet. More particularly, connecting portions 38 include an integrally, generally U-shaped section 104 (viewed in end elevation, FIG. 9) that opens downwardly and has its axially inner end closed by a part of flange 86 on connecting portion 38. The bight 106 of the U is then disposed uppermost and extends generally parallel relative to the axis of the suction hose. It includes a V-shaped groove 108 opening towards the major extent of the suction hose 16, with this groove serving as the means of engagement with a wall mounted hook 110 or the like (FIGS. 14 and 15) that conveniently suspends the assembly in an out-of-the-way storage position.

Additionally, the just-mentioned position of storage rack 10 also permits the storing retention of one or two conventional wands 111 utilizable on the end of suction hose 16. This occurs in the following manner. The extending ends of tool supporting portions 42 and 46 each include an axially extending tab section 112 (e.g., FIGS. 11 and 13) formed beyond the storage area for dusting brush 20 and upholstery brush 22. Each tab section includes a thinned portion 114 formed by inwardly offsetting of the outer, upper and lower side surfaces of the tab section 112. A rim or lip 116 is thereby formed between the outer axial termination of each tab section 112 and the outer axial termination of each thinned portion 114. A resilient hook 118, disposed on each of the wands 111, may fit over this lip (FIGS. 14 and 15) to retain the same in a stored position, fixed with respect to the tool storage rack 10.

It should be clear that the described tool rack satisfactorily meets the advantages set forth earlier in this disclosure and that the same is done in a most effective manner, without resorting to a highly priced or severely complicated structure. It should also be evident that many modifications could be made to the instant tool storage rack by one skilled in the art that would still fall within the spirit and purview of the description advanced.

What is claimed is:

1. A tool storage rack for use with a floor care appliance having a suction hose means, the combination including;
  - a. a one-piece tool storage means including living hinge means;
  - b. said one-piece tool storage means being folded to form a first surface;
  - c. one of said floor care appliance and said suction hose including a second surface, and
  - d. said first surface complementary to said second surface for conforming thereto so as to be closely abuttingly mounted thereon so that said one-piece tool storage means is fixed to one of said floor care appliance and said suction hose means.
2. The tool storage rack set out in claim 1 wherein;
  - a. said first surface is an internal surface of said folded, one-piece tool storage means.
3. The tool storage rack set out in claim 1 wherein;
  - a. said second conforming surface is an external surface formed by a tubular portion of one of said floor care appliance and said suction hose means.
4. The tool storage rack set out in claim 3 wherein;

- a. said tubular portion is generally cylindrical in shape.
- 5. The tool storage rack set out in claim 1 wherein;
  - a. said one-piece tool storage means including living hinge means is folded to form a closed configuration, and
  - b. means are provided with said tool storage means for maintaining said folded configuration.
- 6. The tool storage rack set out in claim 5 wherein;
  - a. said means for maintaining said folded configuration comprises lockable tab means inserted into locking reception means.
- 7. The tool storage rack of claim 1 wherein;
  - a. said tool storage means includes a pair of mirror image portions;
  - b. said mirror image portions being disposed in abutting engagement with one another when said tool storage means is in folded condition.
- 8. A tool storage rack for use with a suction hose coupling including;
  - a. means for mounting said tool storage rack on said suction hose coupling including mirror image portions of said tool storage means;
  - b. reception means in said storage rack for storingly receiving cleaning tools;
  - c. locking means carried by said tool storage rack for retaining said mounting of said tool storage rack on said suction hose coupling, and
  - d. said mirror image portions of said tool storage means being folded into abutting engagement to form said tool storage means, said tool storage means, in folded condition, conforming to said suction hose coupling.
- 9. A tool storage rack for use with a floor care appliance having a suction hose means, the combination including;
  - a. a one piece tool storage means including living hinge means;
  - b. said one piece tool storage means folded to form substantially a bore;
  - c. said suction hose means including a fitting having a substantially cylindrical section;
  - d. said bore of said tool storage means conforming to said substantially cylindrical suction fitting means for reception of the same so that said tool storage means is mounted thereon and fixed relative to said suction hose means.
- 10. The tool storage rack of claim 9 wherein;

- a. said tool storage means and said suction fitting hose means have projecting button means and button receiving means;
- b. said button means being received in said button receiving means to prevent relative displacement between said tool storage means and said suction hose means.
- 11. A tool storage rack for use with a floor care appliance having a suction hose means, the combination including;
  - a. a one-piece tool storage means including living hinge means;
  - b. said one-piece storage means being folded to form a first surface;
  - c. one of said floor care appliance and said suction hose means including a second surface;
  - d. said first surface complementary to said second surface for conforming thereto for mounting thereon so that said one-piece tool storage means is fixed to one of said floor care appliance and said suction hose means;
  - e. said tool storage means including a pair of mirror image portions;
  - f. said mirror image portions being disposed in abutting engagement with one another when said tool storage means is in folded condition, and
  - g. said folded condition providing coincidental receptacle means extending through said mirror image portions for the easy insertion and retention of cleaning tools therein.
- 12. The tool storage rack of claim 11 wherein;
  - a. said mirror image portions also include internal surfaces forming bore segments;
  - b. said internal surfaces forming at least part of said first surface.
- 13. The tool storage rack of claim 12 wherein;
  - a. said second surface is formed by a generally cylindrical surface on said suction hose means.
- 14. The tool storage rack of claim 13 wherein;
  - a. said tool storage means includes hook means;
  - b. said hook means providing for storing said tool storage means and suction hose means in suspended condition for out-of-the way storage.
- 15. The tool storage rack of claim 14 wherein;
  - a. said tool storage means includes engaging means for the storage of a wand or the like when the tool storage means is in said out-of-the-way storage.

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