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(74) Agent: WOLFSON, Michael, I.; Greenberg Traurig, LLP,
MetLife Building, 200 Park Avenue, 34th Fl, New York,
NY 10166 (US).

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(71) Applicant (for all designated States except US):
EURO-PRO OPERATING, LLC [US/US]; 1210
Washington Street, West Newton, MA 02465 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): ROSENZWEIG,
Maximilian [CA/CA]; 2577 Atwater #913, Montreal, QC
H3H 2R2 (CA). VRDOLJAK, Ognjen [HR/CA]; 4112
9th Street, Laval, QC H7W 1Y3 (CA).

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(54) Title: STEAM MOP

(57) Abstract: A steam mop having a main body with a boiler, a water container, a mechanical water pump between the boiler and container and a boiler steam outlet connected to a fabric steam pocket frame. The water pump is actuated by movement of the mop when cleaning to send water to the boiler. The steam pocket frame is substantially rectangular with a plurality of baffles to distribute steam disposed substantially perpendicular to a steam channel having openings to distribute steam between the baffles. A replaceable fabric pocket fits snugly over the frame to distribute cleaning steam to the surface to be cleaned.

STEAM MOP

BACKGROUND OF THE INVENTION

[0001] The invention relates generally to a steam mop, and more particularly to
5 a steam mop including a mechanical water pump that is actuated by the movement of
a user to pump water from a water container to a boiler for generating steam to be
distributed to a steam pocket applied to a surface to be cleaned.

[0002] Conventional mops have been widely used for cleaning floors.
However, conventional mops have not been effective at cleaning dirt in small crevices
10 and floor gaps. In addition, conventional mops require frequent rinsing since mops can
only effectively clean a small surface area at a time.

[0003] Steaming devices used to apply steam to household objects are well
known. The uses of the devices vary widely, and may include the application of
steam to drapes or other fabrics to ease wrinkles, and the application of steam to
15 objects to assist in cleaning the objects.

[0004] Typical steam devices have a reservoir for storing water that is
connected to an electrical water pump with an on/off switch. The exit from the
electric water pump is connected to a steam boiler with a heating element to heat the
water. The heated water generates steam, which may be directed towards its intended
20 destination through a nozzle which controls the application of the steam. Variation of
the shape and size of the nozzle allows for preferred distribution of generated steam to
an object to be cleaned. The nozzles may be disconnectable from the steam generator
to allow different nozzles to be utilized, based on the object to be steamed. The
nozzle may be either closely coupled to the steam generator, or located at a distance
25 from the steam generator, requiring tubing or other steam transfer structures to be
interconnected between the steam generator and the discharge nozzle. Typically, it is
beneficial to provide suitable connectors between the steam generator and the nozzle

to allow either the nozzle to be connected to the steam generator, or to allow the interpositioning of transfer tubes or hoses between the steam generator and the nozzle.

[0005] In general, the nozzles used with the steam cleaners do not have large surface areas and a cloth to absorb the liquid condensate of the steam. In order to increase the cleaning surface area, a flat fabric piece is folded around a flat brush or nozzle. The folded fabric on top of the brush or nozzle is secured by a clip on top of the piece. Often steam injected behind the cloth passes through the cloth at the points the bristles contact on the cloth. This tends to wet the cloth and reduce the cleaning effectiveness of the steam. In addition, the cloth covers must be carefully attached not to cover the front or back of the brush attachment.

[0006] Notwithstanding the wide variety of steam generating appliances available, there exists the need to provide an easy to use steam mop. That will effectively improve the effective steaming surface area of the steam cleaners. It is desirable to provide this device with the ability for a user to clean a larger surface area easily without worrying about wiping up the liquid condensate of the steam when cleaning flooring, furniture and other household items.

SUMMARY OF THE INVENTION

[0007] Generally speaking, in accordance with the invention, a steam mop having a water pump for selectively injecting water from a reservoir to a boiler is provided. The mop includes a housing with an electric boiler and a water pump coupled to a water tank with the pump being actuated by the user's movement to pump water to the boiler for distribution to a steam pocket frame attachment. A fabric steam pocket is mounted on the steam pocket frame to provide a improved cleaning surface.

[0008] The steam pocket frame is connected to the housing to allow steam from the boiler to be delivered to the steam pocket. In one embodiment, the steam pocket frame is connected to the boiler by at least one side arm. In another

embodiment, water is stored in a water tank formed as part of the handle. Water is pumped to the boiler only when a user pushes on the handle for generating steam to be fed to the steam pocket frame through the side arm.

5 [0009] The steam pocket frame is substantially rectangular with a plurality of baffles extending substantially perpendicular to the cleaning surface on both upper and lower surfaces thereof. The steam pocket frame includes a central passageway extending perpendicular to the baffles that has openings between the baffles to direct steam into the space between the baffles and up to the surfaces of a fabric steam pocket mounted on the frame.

10 [0010] In one embodiment, the steam pocket frame is pivotally connected to one side arm for allowing the frame to be flipped over to provide an additional cleaning surface. In another embodiment, there are two side arms also allowing the frame to be flipped over. This allows the mop to be used backward or forwards and is easy to use by right or left handed users.

15 [0011] The fabric steam pocket is two layers of fabric joined at three edges with fasteners at the open edge for fastening over the frame, or one layer of fabric wrapped around the frame and Velcro strips on the front or back (or left or right) longitudinal side of the frame for easy installation over the frame. The steam pocket frame is operatively connected to the steam cleaner outlet pipe. When steam is
20 injected into the pocket, the entire surface area of the fabric may be used to steam clean a surface.

[0012] Accordingly, it is an object of the invention to provide a steam mop and steam pocket frame attachment to provide increased steam cleaning surface area.

[0013] Another object of the invention is to provide a steam mop with a
25 mechanical pump that is actuated by the user's movement of pushing the mop forward and pulling backward to clean and does not need a high steam pressure system.

[0014] Another object of the invention is to provide a fabric steam pocket that is easily mounted on a steam pocket frame.

[0015] A further object of the invention is to provide a steam pocket frame attachment with a fabric cover that does not allow steam to escape at points of contact
5 with brush bristles.

[0016] Yet another object of the invention is a fabric steam pocket that can be used for dual side cleaning.

[0017] Still other objects and advantages of the invention will in part be obvious and will in part be apparent from the specification.

10 [0018] The invention accordingly comprises a product possessing the features, properties, and the relation of components which will be exemplified in the product hereinafter described, and the scope of the invention will be indicated in the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

15 [0019] For a fuller understanding of the invention, reference is made to the following description taken in connection with the accompanying drawing(s), in which:

[0020] FIG. 1 is a perspective view of steam mop having one side arm including a steam pocket frame attachment for receiving a fabric steam pocket constructed and arranged in accordance with one embodiment of the invention;

20 [0021] FIG. 2 is a front plan view of a housing and assembly for use with the steam mop of FIG. 1;

[0022] FIG. 3 is a perspective view of a bellows pump suitable for use with the steam mop of FIG. 1;

[0023] FIG. 4 is a plan view of a water container suitable for use with the steam mop and handle shown in FIG. 1;

[0024] FIG. 5 is a perspective view of a handle suitable for use with the steam mop of FIG. 1;

5 [0025] FIG. 6A is a top plan view of a steam pocket frame for use with the steam mop of FIG. 1;

[0026] FIG. 6B is a plan view in cross-section of the steam pocket frame of FIG. 6A;

10 [0027] FIG. 7 is a perspective view of a fabric steam pocket suitable for use with the steam pocket frame attachment of FIG. 11;

[0028] FIG. 8 is a perspective view of the mop of FIG. 1 with a fabric steam pocket mounted on the attachment frame;

[0029] FIG. 9 exploded perspective view showing how the steam mop of the type shown in FIG. 1 is assembled;

15 [0030] FIG. 10 is a perspective view of a steam mop including two side arms constructed and arranged in accordance with another embodiment of the invention;

[0031] FIG. 11 is a perspective view showing a fabric steam pocket mounted onto the steam pocket frame of FIG. 10;

20 [0032] FIG. 12 is an exploded perspective view showing how the steam mop of FIG. 10 is assembled; and

[0033] FIG. 13 is a perspective view of a piston pump suitable for use with the steam mop of FIG. 1.

DETAILED DESCRIPTION OF THE INVENTION

[0034] FIG. 1 is a perspective view of a steam mop 10 constructed and arranged in accordance with one embodiment of the invention. Mop 10 includes a steam pocket frame 21 mounted to a housing or main body 16 by a side arm 17. A water container or tank 14 is mounted to the upper part of housing 16 with a handle 11 and in connected to a boiler 46 by a pump 29 having a one-way outlet valve 37. A water container cover 19 is closed when handle 11 is installed. Water container 14 also has a handle release button 13 for ease of use to easily detach and attach handle 11. Any type of mechanical pump or some other means of transporting the water to the boiler may be used with steam mop 10. Preferably, pump 29 is a mechanical pump, such as a bellows pump or a piston pump, that is actuated by movement of mop 10 by a user pushing and pulling handle 11.

[0035] Steam pocket frame 21 is rectangular in shape and includes a steam inlet coupling 22 at the side end and at the end of side arm 17. Steam generated in a steam boiler 46 shown in FIG. 2 dispenses steam into arm 17 and into frame 21. A rectangular fabric steam pocket 24 is mounted over frame 21 and is attached to the steam inlet coupling 22 side thereof by Velcro strips 66 and 67 as shown in FIG. 7.

[0036] FIG. 2 is a front plan view of housing 16 of steam mop 10 including boiler 46 with a water hose 41 having a water inlet 38 and a water outlet 39. Water flows through one-way outlet valve 37 (shown in FIG. 3) to water inlet 38 and enters boiler 46 via through water hose 41. A steam hose 44 with a steam inlet 42 and a steam outlet 43 is coupled to boiler 46. Water inlet 38 and boiler 46 are connected to a power source by a power cord 47. Steam generated in boiler 46 exits through steam hose 44 with steam inlet 42 and steam outlet 43. Conveniently, main body 16 also includes an indicator light 49 to indicate when steam temperature is appropriate for use.

[0037] FIG. 3 is a perspective view of an exemplary embodiment of a pump that can be used with steam mop 10. Here, a mechanical bellows pump 29 is shown

in FIG. 3 as suitable for use with steam mop 10. Bellows pump 29 includes a pump inlet 29a and a pump outlet 29b. Bottom portion 14b of water container 14 is attached to pump inlet 29a through a conduit 31. Arrow A shows the direction of water flow. Pump outlet 29b is connected to a one-way duck bill inlet valve 33. Pump inlet 29a and pump outlet 29b are connected by a cylindrical flexible tubular bladder 33 with a plurality of creases 34. Water can only flow in one direction through valve 33. Pump outlet 29b is connected to a second one-way duck bill valve 37 in the bottom portion of bellows pump 29.

[0038] Pump 29 operates when conduit 31 is moved up and down by the movement of user so that distance B increases and decreases. When handle 11 is pulled up and distance B decreases, water fills bellows 34. Bellows 34 is compressed as handle is pushed, distance B increases and water is ejected from bellows 34 through second duck bill valve 37 in bottom portion 29a of pump 29 and into water conduit 41 and into boiler 46. Accordingly, a user may selectively deliver water to boiler 46 by the movement of pushing the mop forward and pulling the mop backward to clean. If there is no movement by the user, water is not delivered to boiler and steam is not generated. Only when the user moves the mop forward and backward will steam be generated and released. Steam mop 10 is designed as a non-pressurized system. For floor cleaning there is no need for high pressure steam. Cleaning is performed by steam distribution to a fabric steam pocket 24 mounted on frame 21.

[0039] Water container 14 suitable for use with the steam mop 10 is shown in FIG. 4. Water container 14 has a top portion 14a and a bottom portion 14b. Here, top portion 14a has a cone shaped open top 28 that functions as a funnel for the user to easily fill water into water container 14. Water container cover 19 shown in FIG. 5 covers cone shaped open top 28 of water container 14 when assembled. A user presses handle release button 13 to disassemble handle 11 from water container 14 for ease of filling container 14.

[0040] FIG. 5 is a perspective view of handle 11 for use with steam mop 10. Handle 11 has an adjustable height button 12 and includes at the distal end of water

container cover 19, which connects to water container 14. Preferably, handle 11 is a telescopic handle.

[0041] FIG. 6A is a top perspective view of a rectangular steam pocket frame 21 including a front wall 51, a rear wall 52, a right side wall 53 and a left side wall 54. A plurality of baffles 58 extends from front wall 51 to rear wall 52 within frame 21. Baffles 58 are planar in shape and extend perpendicular from the front wall to the back wall of frame 21. Frame 21 has right side wall 53 with steam inlet coupling 22 connected thereto. Right side wall 53 also connects to arm 17. Frame 21 has a passageway 61 that extends from right side wall 53 to left side wall 54 perpendicular to baffles 58. Passageway 61 has a plurality of vents or openings 62 for distributing steam into the spaces between baffles 58 and to a steam pocket mounted thereon. An advantage of steam pocket frame 21 is that steam rises out of upper surface of frame 21 to provide a dry surface with the benefits of steam when cleaning.

[0042] FIG. 6B is a plan view in cross-section of steam pocket frame attachment 21. The plurality of vents 62 are on both sides of passageway 61 and are parallel to baffles 58. FIG. 7 shows a top cross-sectional view of steam pocket frame attachment 21.

[0043] In FIG. 7, steam pocket 24 is configured to slip over frame 21. In this respect, it is formed of a first layer 24a and an opposed second layer 24b (not shown), each having a rectangular shape with two opposed long edges 24c and 24d and two opposed short sides 24e and 24f. Long edges 24c and 24d and one long side 24f are stitched to form pocket 24.

[0044] Straps 66 and 67 are fixed to an open side of steam pocket 24. In the preferred embodiment, fasteners 66 and 67 are Velcro-type fasteners. Alternatively, straps 66 and 67 may include buttons or snaps. In each case, straps 66 and 67 are placed over frame 21 and secured to hold pocket 24 in place when used to clean a floor or other surface.

[0045] In the illustrated embodiment, steam pocket 24 is a cloth or towel. It may be formed of any suitable fabric such as cotton or a synthetic fabric, such as polyester or polyolefin fiber. Preferably, the fabric of pocket 24 is a microfiber. Most preferably, the microfiber is a synthetic polyester microfiber.

5 [0046] FIG. 8 shows fabric steam pocket 24 mounted onto the steam pocket frame attachment 21 suitable for use with the steam pocket frame attachment of FIG. 1. This is also shown by the direction of Arrow C. Steam pocket frame attachment 21 may be rotated as shown by Arrow D so user may use both sides of steam pocket fabric 24 without having to reinstall steam pocket 24. This extends the time steam
10 pocket 24 may be used without having to rinse and reinstall it.

[0047] FIG. 9 is an exploded perspective view showing how the steam floor mop of the type shown in FIG. 1 is assembled, which is indicated by arrows.

[0048] FIG. 10 is a perspective view of steam floor mop 100 including a steam pocket frame 121 for receiving a fabric steam pocket cover constructed and arranged
15 in accordance with an embodiment of the invention. All elements in FIG. 10 are present and identified by the same reference numerals plus 100. Here, a steam pocket frame 121 is mounted on the distal end of two side arms 117 and 118 coupled to a housing 116. Steam pocket frame 121 is rectangular in shape and includes a steam inlet coupling 122 at side end. A steam outlet 123 dispenses steam into side arm 117
20 into a steam pocket frame fabric pocket 124. Frame 121 also has a left side wall that has a connector 130 that connects arm 118.

[0049] FIG. 11 is a perspective view of a rectangular fabric steam pocket 124 that shows how rectangular steam pocket fabric 124 is installed on steam pocket frame 121. Fabric steam pocket 124 is wrapped around the front wall 151 and back
25 wall 152 circumference of steam pocket frame 121. This is also shown by the direction of Arrow B. Both top side and bottom side of rectangular steam pocket fabric 124 is secured by Velcro-type strip 127 to the front wall 151 or back wall 152 of steam pocket frame 121.

[0050] In the illustrated embodiment, steam pocket 124 is a cloth or towel. It may be formed of any suitable fabric such as cotton or a synthetic fabric, such as polyester or polyolefin fiber. Preferably, the fabric of steam pocket 124 is a microfiber. Most preferably, the microfiber is a synthetic polyester microfiber.

5 **[0051]** Steam inlet coupling 122 and connector 130 attached to steam pocket frame 121 and may be rotated as shown by Arrow B so user may use both sides of steam pocket fabric 124 without having to reinstall steam pocket 124. This extends the time steam pocket 124 may be used without having to rinse and reinstall it.

[0052] FIG. 12 is an exploded perspective view showing how the steam floor mop of the type shown in FIG. 10 is assembled, which is indicated by arrows.
10

[0053] FIG. 13 is a perspective view of another exemplary embodiment of a pump that can be used with steam mop 10. Here, a mechanical piston pump 79 is shown in FIG. 13 as suitable for use with steam mop 10. Piston pump 79 includes a pump inlet 79a and a pump outlet 79b. Bottom portion 14b of water container 14 is attached to pump inlet 79a through a conduit 31. Arrow A shows the direction of water flow. Pump outlet 79b is connected to a one-way duck bill inlet valve 33. Pump inlet 79a and pump outlet 79b are connected by a sealed movable joint 83 that will allow a piston 82 to move freely inside a cylinder 81 without leaking water in between them. Water can only flow in one direction through valve 33. Pump outlet
15
20 79b is connected to a second one-way duck bill valve 37 in the bottom portion of piston pump 79.

[0054] Pump 79 operates when conduit 31 is moved up and down by the movement of user so that distance B increases and decreases. When handle 11 is pulled up and distance B decreases, water fills the volume space in a cylinder 81. The
25 volume space in cylinder 81 is compressed by piston 82 as handle is pushed, distance B increases and water is ejected from cylinder 81 through second duck bill valve 37 in bottom portion 29a of pump 29 and into water conduit 41 and into boiler 46. Accordingly, a user may selectively deliver water to boiler 46 by the movement of

pushing the mop forward and pulling the mop backward to clean. If there is no movement by the user, water is not delivered to boiler and steam is not generated. Only when the user moves the mop forward and backward will steam be generated and released. Steam mop 10 is designed as a non-pressurized system. For floor
5 cleaning there is no need for high pressure steam. Cleaning is performed by steam distribution to a fabric steam pocket 24 mounted on frame 21.

[0055] Steam floor mop 10 and 100 provides many advantages for ease of use because it eliminates the need for an electric water pump and an on/off switch to activate the electric water pump. Here, the user has more control over the amount of
10 water needed to be discharged into the boiler and consequently, how much steam is needed by moving the mop forward and backwards. In addition, steam mop is designed as a low pressure or non-pressurized system so it is safer for the user to use. Further, since the amount of water routed to the boiler is controlled, the boiler can create steam in a short amount of time.

[0056] Steam pocket frame 21 and 121 with fabric steam pocket fabric 24 and 124 in accordance with the invention provide vast improvements over placing a towel onto a bristle attachment for a steam cleaner, respectively. The invention avoids
15 puncture of the cloth by the bristles and provides twice the cleaning surface. Moreover, the fabric cover is easily installed and replaced.

[0057] It will thus be seen that the objects set forth above, among those made apparent from the preceding description, are efficiently attained and, since certain changes may be made in the above product without departing from the spirit and scope of the invention, it is intended that all matter contained in the above description
20 and shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

[0058] It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described and all

statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

[0059] The present invention may be embodied in other specific forms without departing from the spirit or essential attributes of the invention. Accordingly, reference should be made to the appended claims, rather than the foregoing specification, as indicating the scope of the invention. A steam pocket frame attachment with a fabric pocket cover in accordance with the invention provides a vast improvement over placing a towel onto a bristle attachment for a steam cleaned. It avoids puncture of the cloth by the bristles and provide twice the cleaning surface. Moreover, the fabric cover is easily installed and replaced.

CLAIMS**WHAT IS CLAIMED IS:**

1. A steam mop, comprising:
a main body having a boiler with a water inlet and a steam outlet positioned
5 therein;
a pump having an inlet and an outlet with the pump outlet connected to the
boiler inlet;
a water container for storing water connected to the pump inlet; and
a steam pocket frame connected to the steam outlet;
10 wherein activation of the pump pumps water from the water container to the
boiler for generation of steam.
2. The steam mop of claim 1, further including a handle coupled to the
pump whereby movement of the handle activates the pump.
15
3. The steam mop of claim 1, wherein the water container is an elongated
cylinder.
4. The steam mop of claim 3, wherein the water container has a filling
20 spout at one end of the elongated cylinder.
5. The steam mop of claim 5, wherein the filling spout is in the shape of
cone.
- 25 6. The steam mop of claim 2, wherein the water container is positioned
between the pump inlet and the handle.
7. The steam mop of claim 1, wherein the pump is a mechanical bellows
pump with a one-way inlet valve and a one-way outlet valve.

8. The steam mop of claim 1, wherein the pump is a mechanical piston pump with a one-way inlet valve and a one-way outlet valve.

5 9. The steam mop of claim 1, wherein the steam pocket frame is connected to the steam outlet by at least one tubular side arm.

10 10. The steam mop of claim 9, wherein the steam pocket frame is substantially rectangular with a front wall, a rear wall, a right side wall, and a left side wall with a central hollow steam channel running from one sidewall to the other side wall; and includes a plurality of baffles disposed perpendicular to the central steam channel between the front and rear walls, wherein the side arm is connected to the central steam channel on the at least one side wall.

15 11. The steam mop of claim 2, wherein the handle is a telescopic handle.

12. The steam mop of claim 2, wherein the bottom of the handle is a water container cover.

20 13. The steam mop of claim 9, wherein there are two opposed side arms connecting the steam outlet of the main body to the steam pocket frame.

25 14. A steam pocket frame for mounting a fabric steam pocket for use with a steam mop having a steam boiler, wherein the frame is a substantially rectangular frame, the frame comprising:

a front wall;

a rear wall;

a right side wall; and

a left side wall;

30 a steam inlet for connection to the steam boiler; and

a plurality of steam baffles for distributing steam to a steam pocket mounted on the frame.

5 15. The steam pocket frame of claim 14, the frame further comprising:
 a plurality of baffles disposed perpendicular to the steam pocket
frame between the front and rear walls; and
 the frame is connected to the steam inlet for receiving steam
from the mop and to distribute steam to a steam pocket mounted on the frame.

10 16. The steam pocket frame of claim 15, wherein the steam pocket frame is
adaptable to be rotatably mounted when attached to a steam inlet arm.

 17. The steam pocket frame of claim 15, wherein the steam pocket frame
has a passageway that extends between the side walls perpendicular to the baffles.

15

 18. The steam pocket frame of claim 17, wherein the passageway has
openings to direct steam into the space between the baffles.

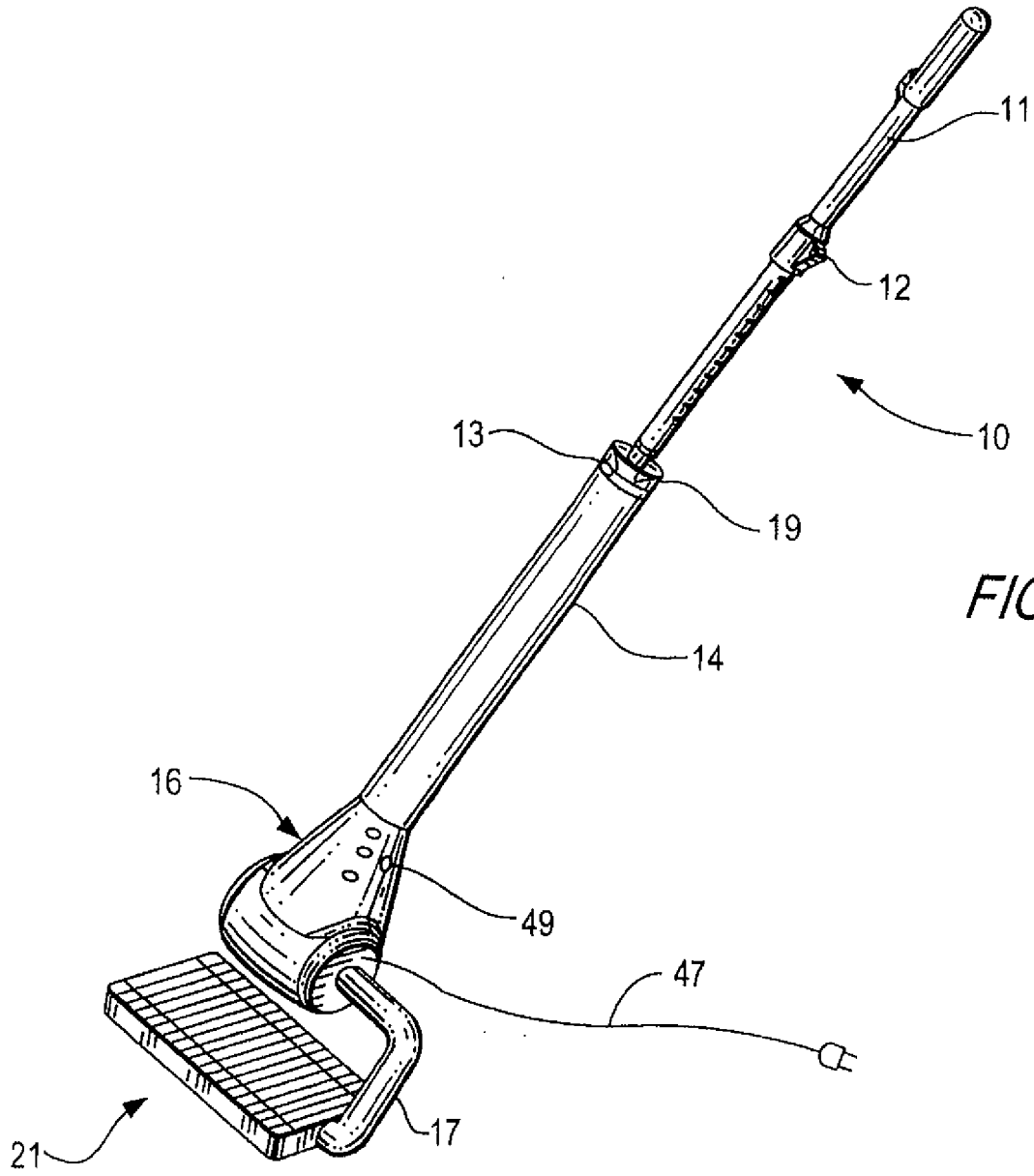


FIG. 1

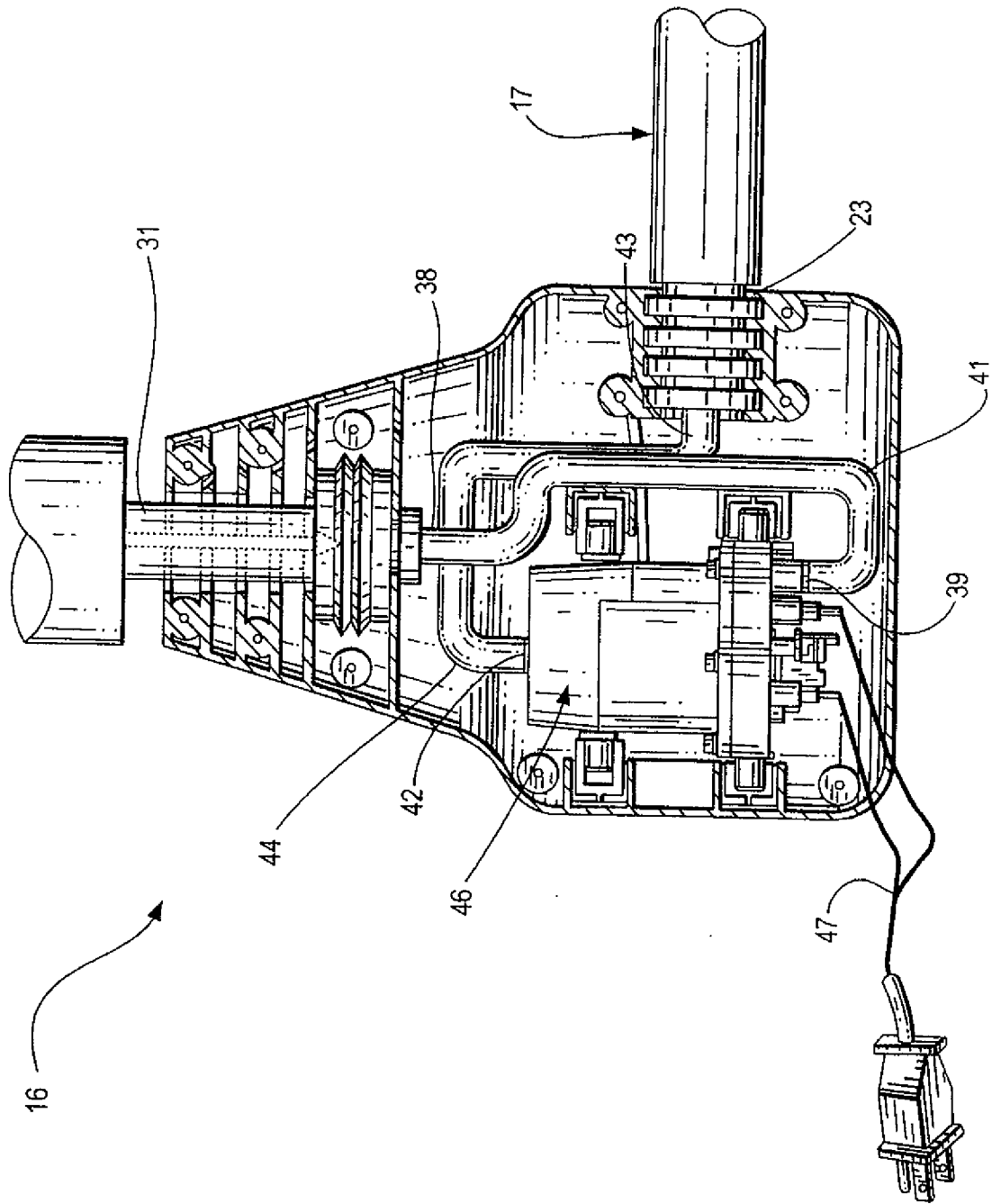


FIG. 2

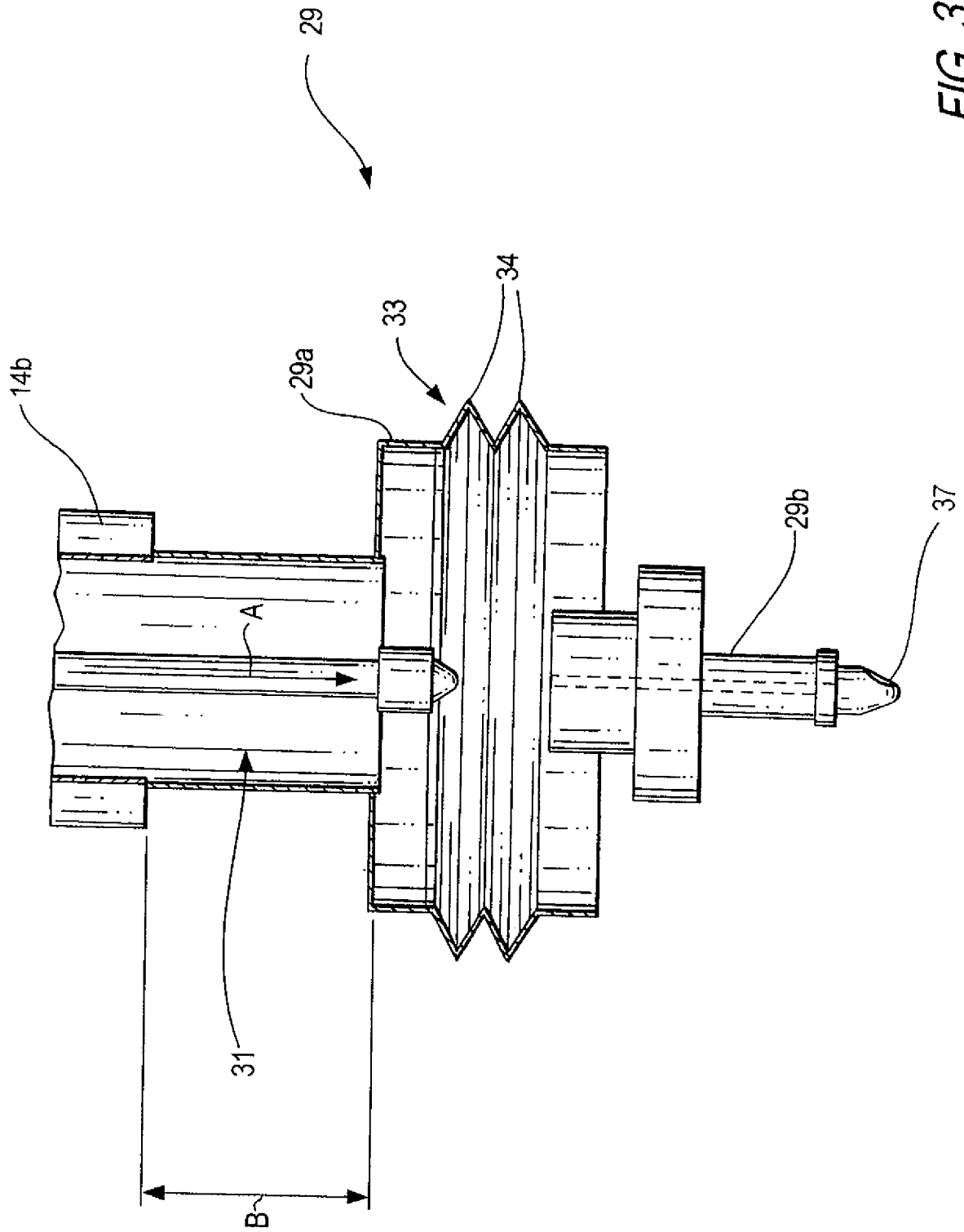
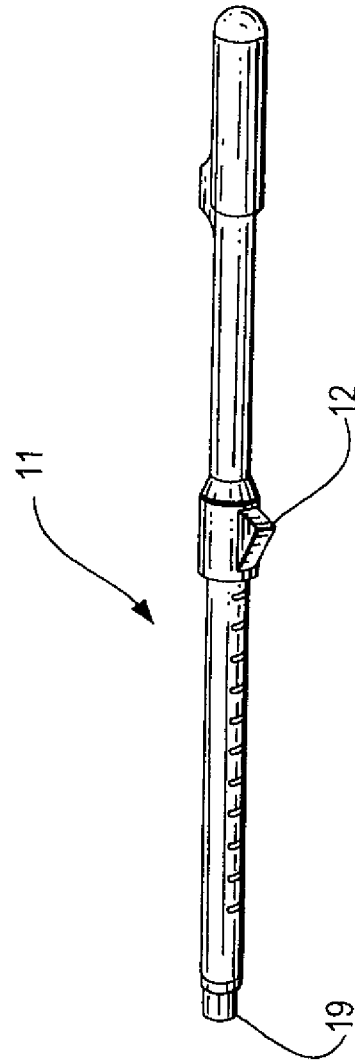
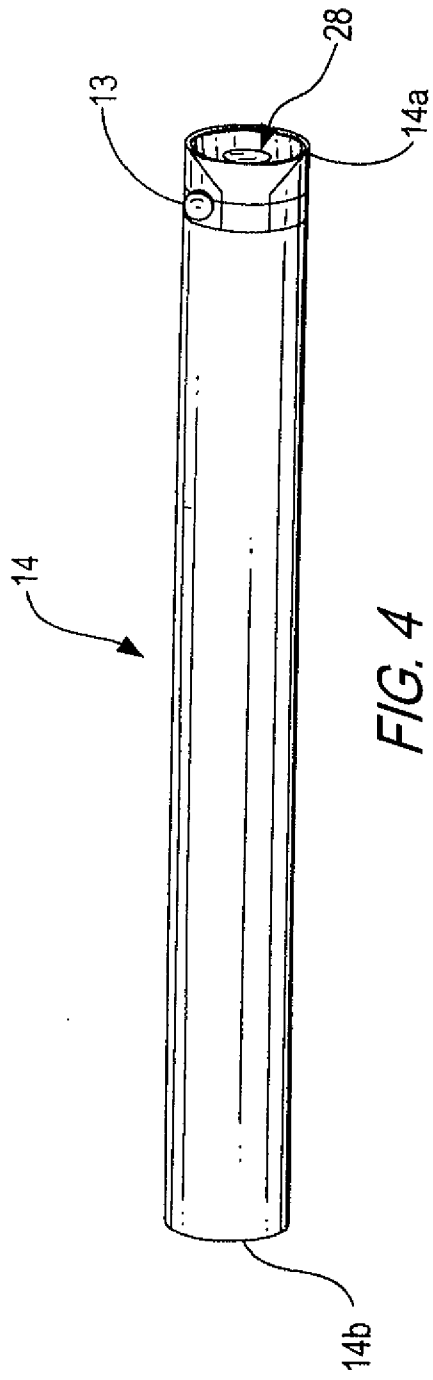


FIG. 3



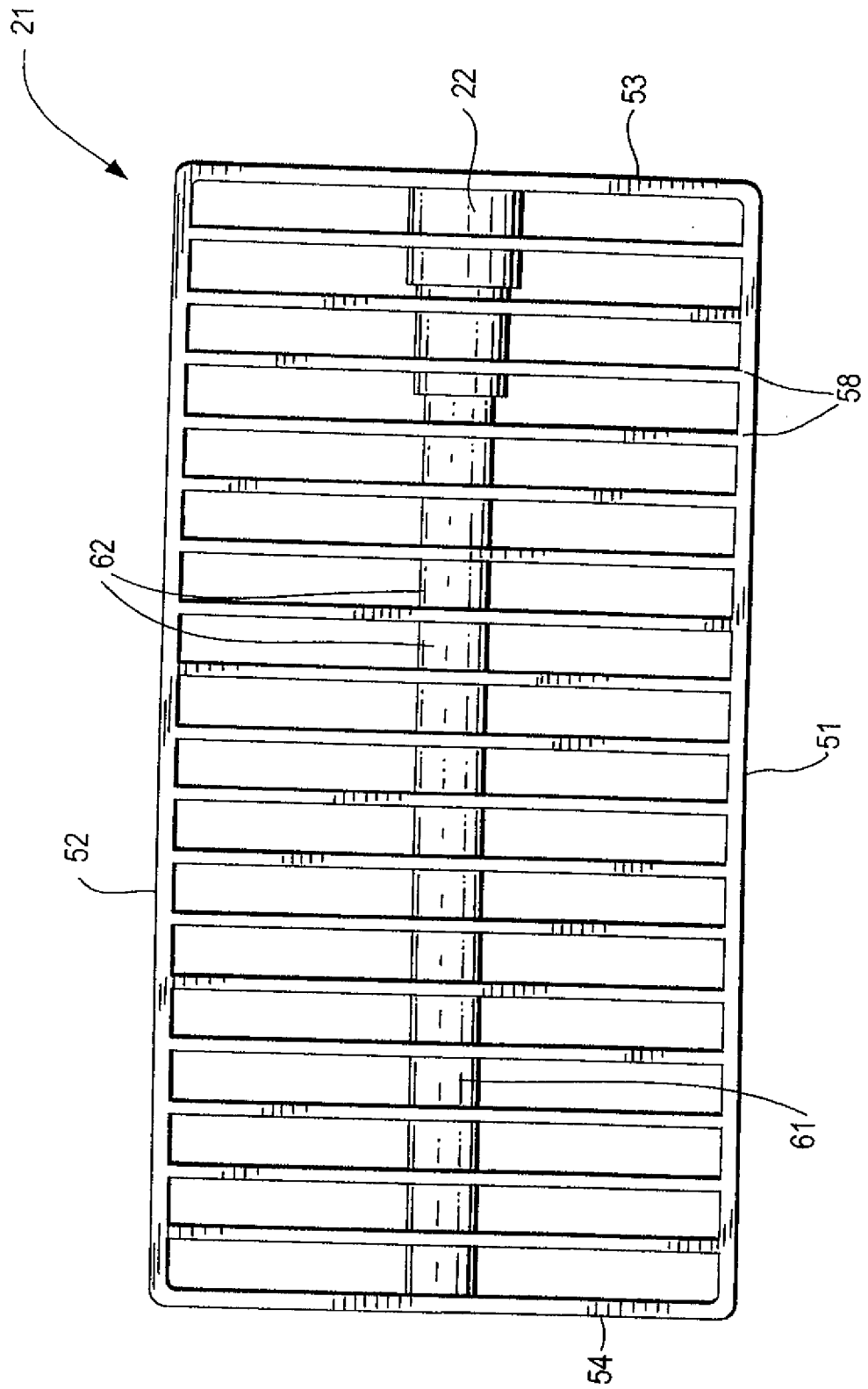


FIG. 6A

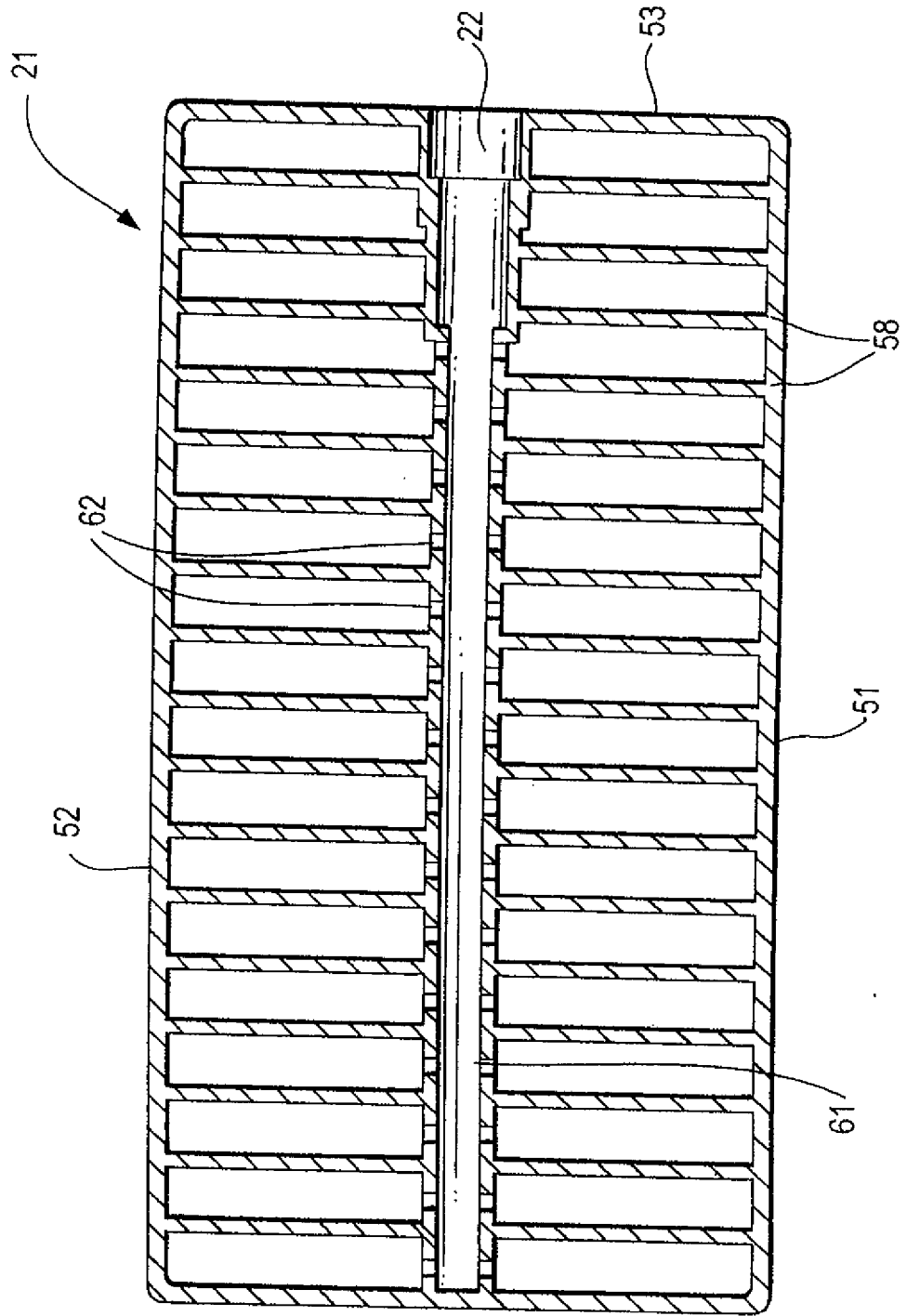


FIG. 6B

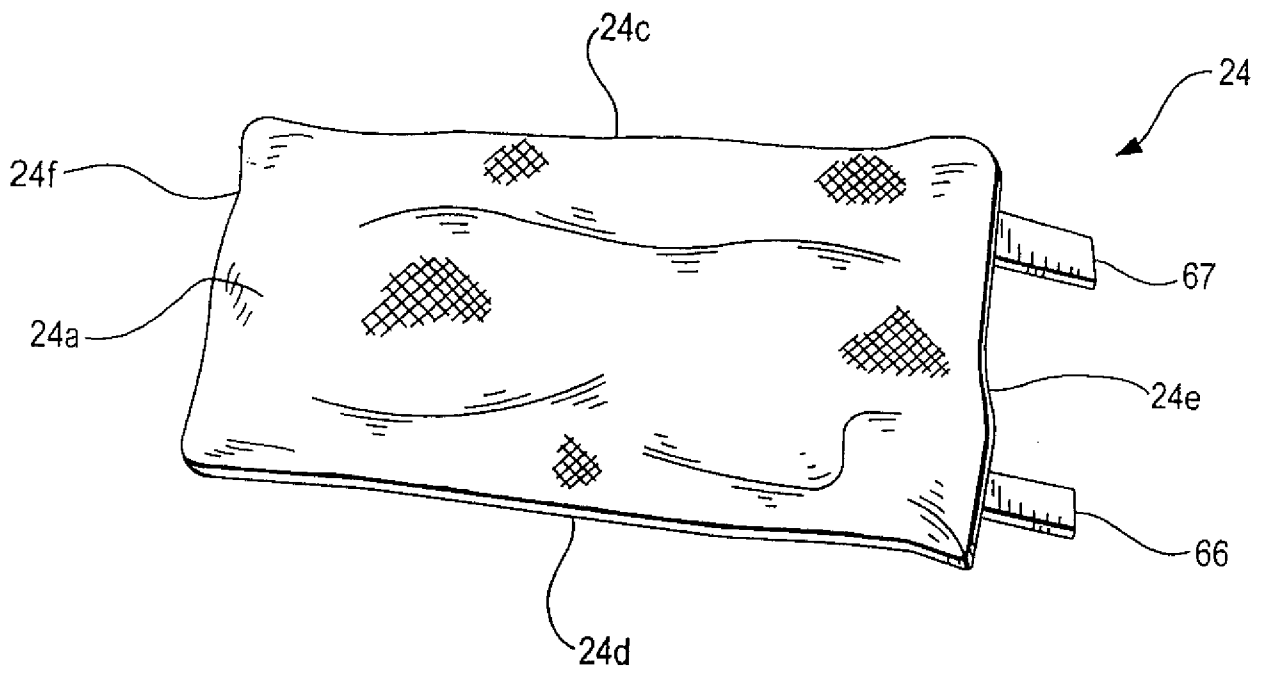


FIG. 7

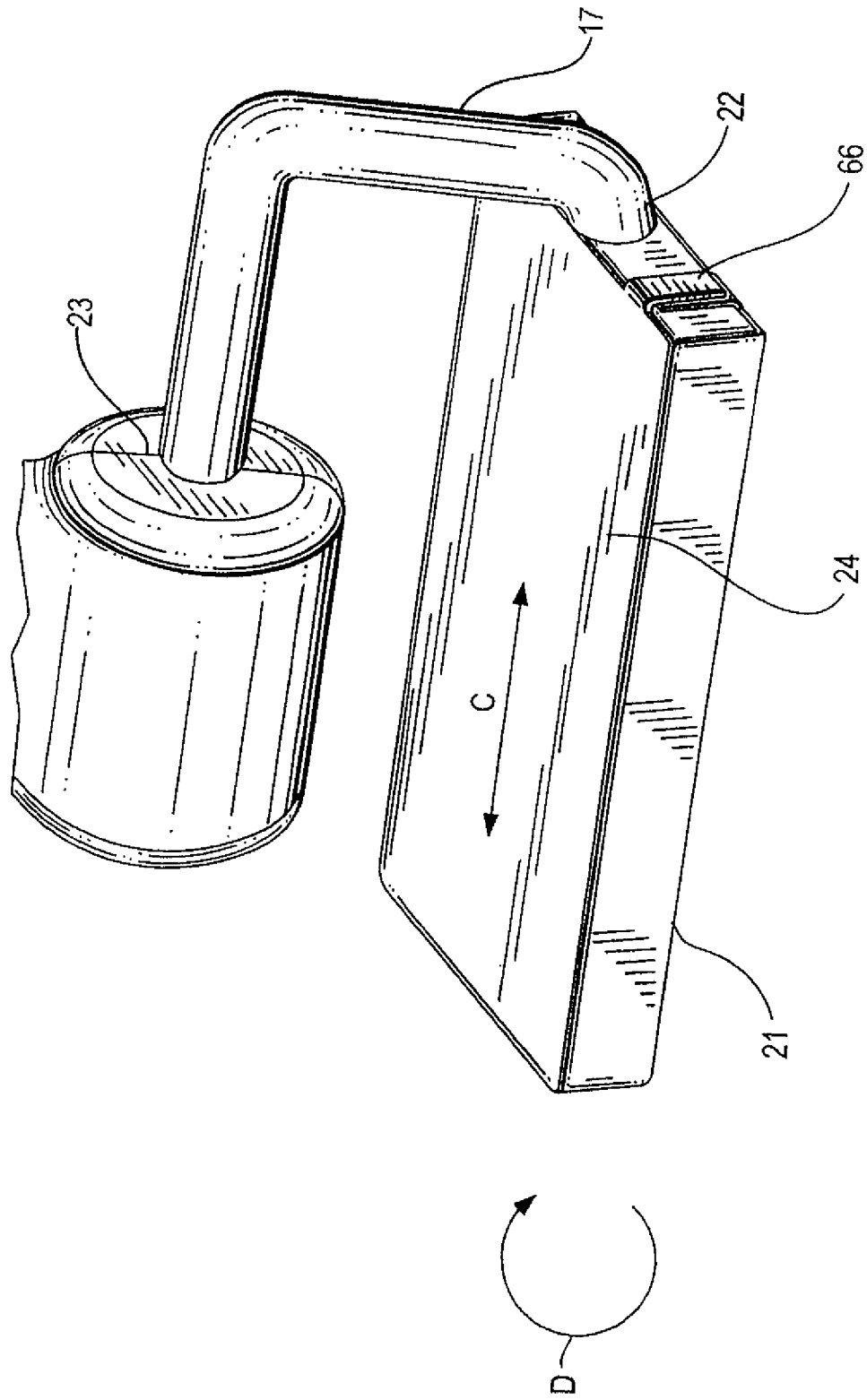


FIG. 8

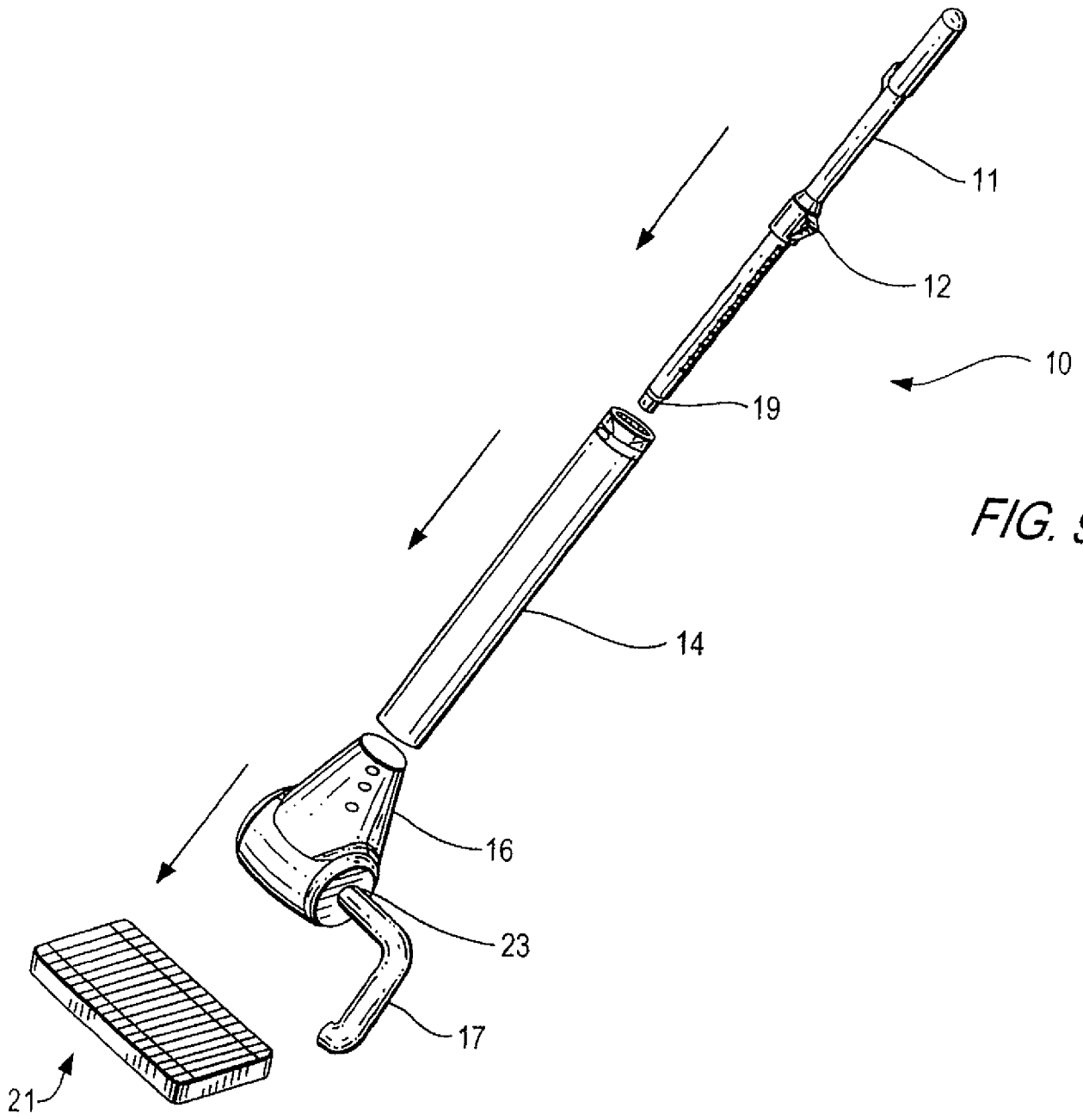


FIG. 9

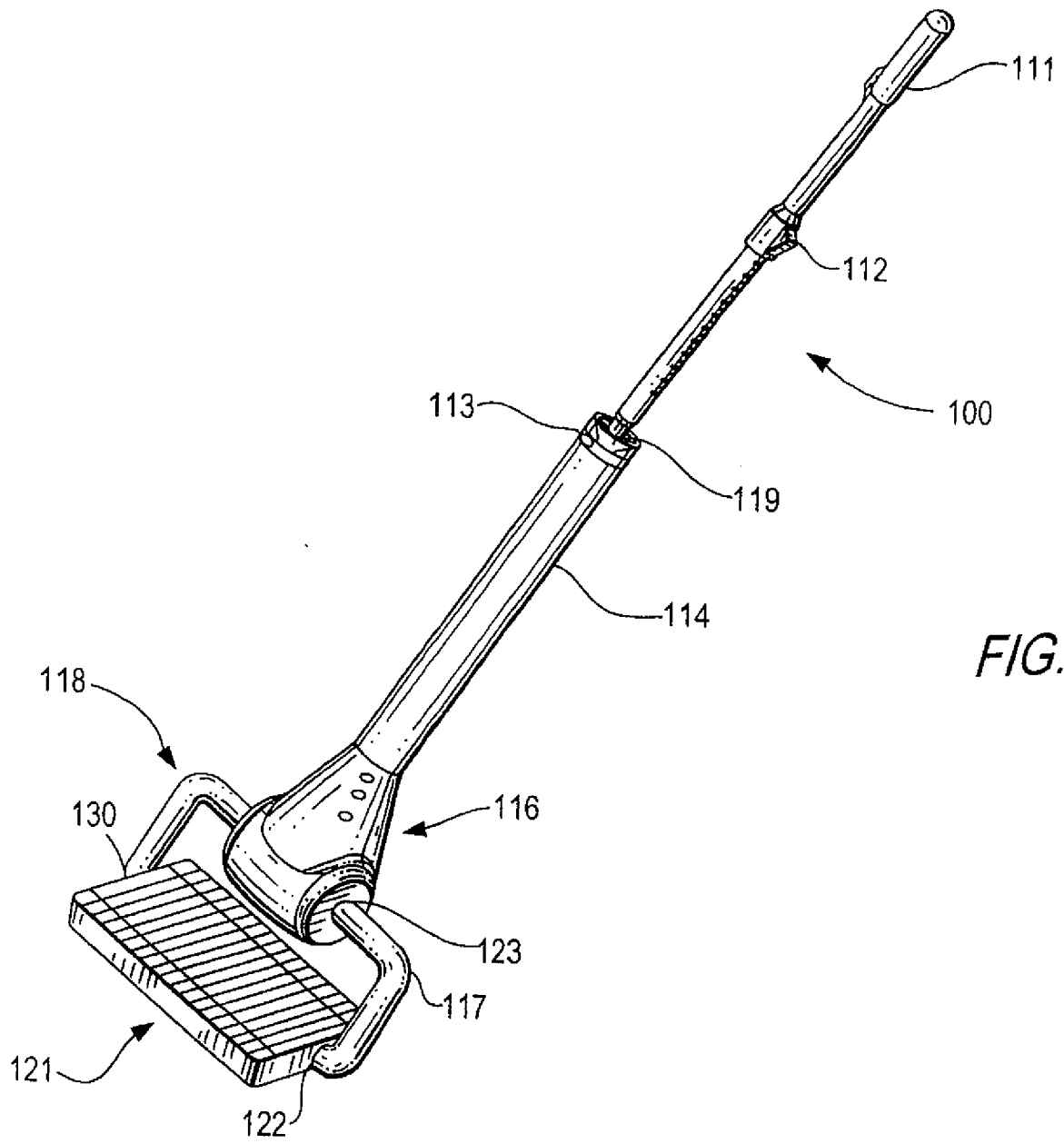


FIG. 10

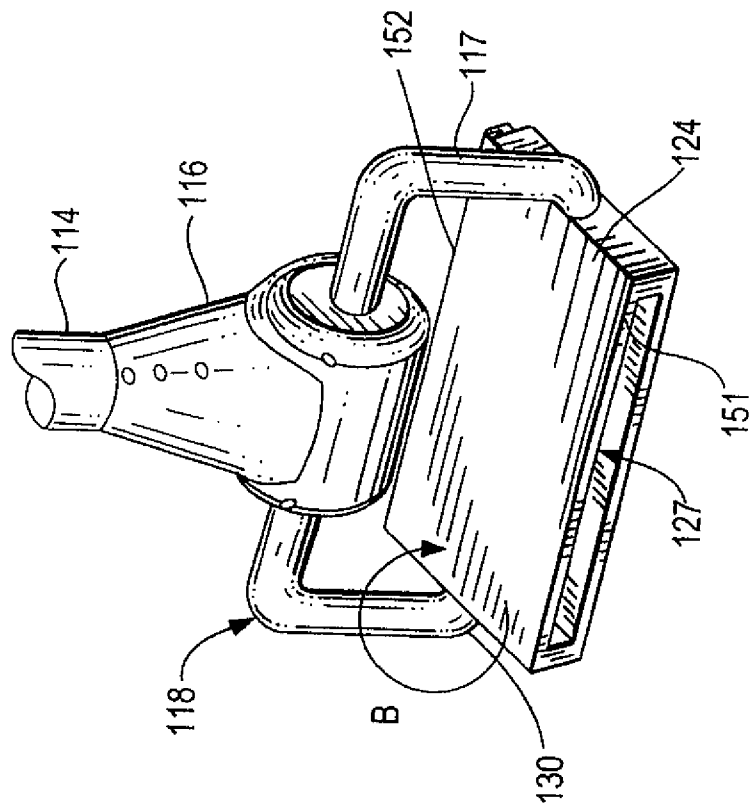


FIG. 11

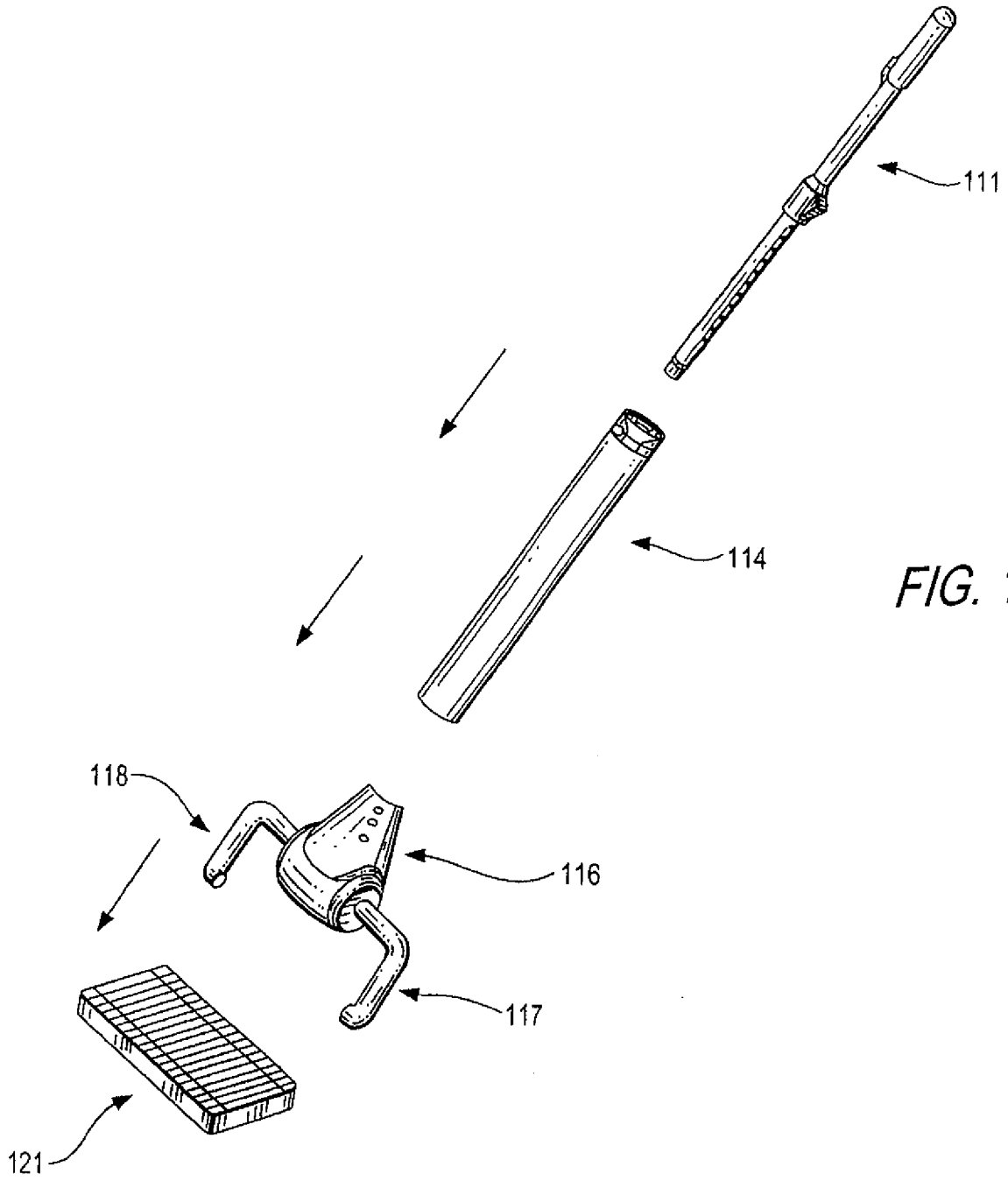


FIG. 12

