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(72) Inventor: **Libman, Robert J.**  
**Champaign, Illinois 61821 (US)**

(74) Representative:  
**Niederkofler, Oswald A. Dipl.-Phys. et al**  
**Samson & Partner**  
**Widenmayerstrasse 5**  
**D-80538 München (DE)**

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(71) Applicant: **THE LIBMAN COMPANY**  
**Arcola Illinois (US)**

(54) **Wringer mop with removable mop head**

(57) A mop (10) has an angled handle (12) and a working end (24) with a pair of opposed rollers (30). An actuator (14) on the mop (10) can be moved between a replacement position, a wringing position, and an intermediate use position. When in the replacement position, a mop head (16) can be removably attached to the working end (24) of the handle (12) by sliding the mop head

(16) sideways so an arm (82) on a connector (18) passes between a shoulder (72) and a bridge (70) on the mop head (16). The connector (18) has a loop (84) at its upper end, and is connected to a slotted mounting stem (48) on an actuator (14). The mop head (16) is also provided with a threaded aperture (74) and slots (76), allowing it to be used in other mops.

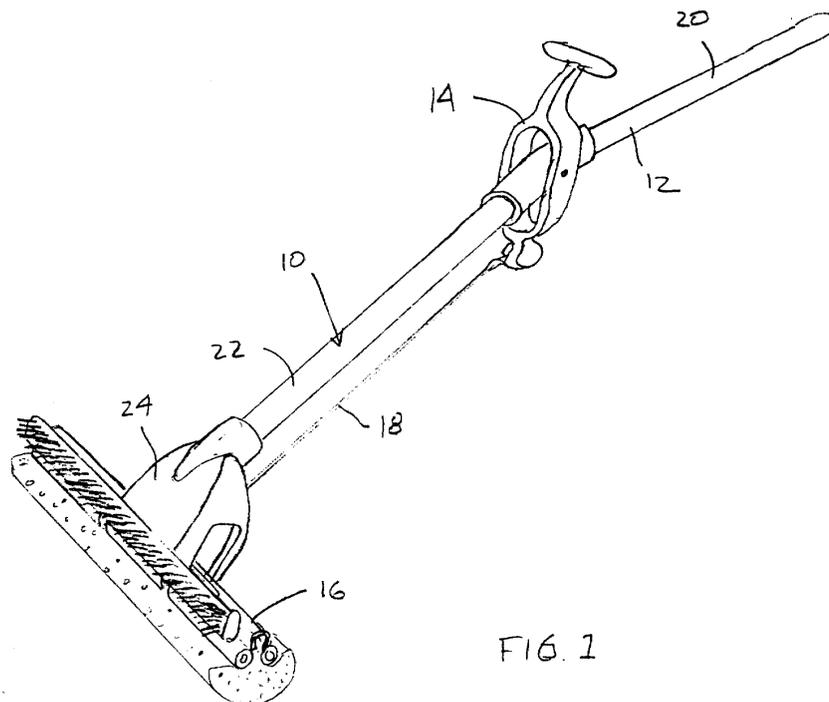


FIG. 1

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**Description**

## CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] Not applicable.

## STATEMENT REGARDING FEDERAL SPONSORSHIP

[0002] Not applicable.

## BACKGROUND OF THE INVENTION

[0003] The invention relates generally to mops, and more particularly to sponge mops with an integral roller.

[0004] Sponge mops have been sold for many years. Various means have been provided to allow the user to wring water from the head of the mop. For example, a broad surface, such as the wringer plate seen in U.S. patent no. D401,702, can be used to be used to squeeze water from a mop head. Alternatively, the mop can be provided with opposed plates, such as those shown in U.S. patent no. D393,589, that allow the sponge to be doubled over itself laterally. Still another alternative is to provide the mop with opposed rollers through which the mop head can be wringed. One example of such rollers can be seen in U.S. patent no. D302,759.

[0005] The wringing assemblies used in such mops can be relatively expensive and much longer lived than the mop head of the mop. Accordingly, consumers benefit if they can easily replace the relatively-inexpensive mop head of such a mop, and reuse the more expensive and durable handle and wringer mechanism.

[0006] While replaceable mop heads have been known, they can be difficult to use. For example, M.B. Walton, Inc. sells a sponge mop that requires the user to place the mop head in its normal use position and then reach between the rollers and the handle to insert two wires into eyes on the mop head. Similarly, Quickie Manufacturing Corporation sells a mop that also requires the user to place the mop head in its normal use position and then reach between the rollers and the handle to screw a rod onto a threaded aperture.

## BRIEF SUMMARY OF THE INVENTION

[0007] This invention provides a significant improvement over the prior art. Like some prior mops, the mop includes a handle, a replaceable mop head, a pair of opposed rollers, and an actuator that uses a connector to enable the user to pull the sponge in the mop head between the rollers to wring the mop. Unlike prior mops, however, the actuator in the new mop can be used to push the mop head downwardly, free of the rollers, so the mop head can be removed by simply sliding it to the side. A new mop head can be added by a similar sliding operation, followed by pushing the actuator to the nor-

mal use position.

[0008] Several other features also contribute to the desirability and usefulness of this mop. The handle on the new mop is angled, placing the actuator in a relatively high and easy-to-use position. The engagement of a loop on the upper end of the connector over a slotted mounting stem on the actuator provides a simple and effective way to link the connector to the actuator. The working end of the mop may also be provided with a removable brush for use on heavily soiled areas.

[0009] The mop head itself may be configured so it can also be used with other mops. For example, the mop head can be provided with a threaded aperture to allow it to be used with some other mops now in common use.

The mop head can also be provided with removable ring tabs that fit in spaced-part slots on the mop head, enabling the mop head to also be used with still other mops now on the market.

[0010] The resulting mop is effective, simple to manufacture, and easier to assemble, disassemble, and reassemble than previously-known mops. Further advantages of the invention should be apparent to those skilled in the art upon reviewing the following detailed description in conjunction with the accompanying drawings, in which:

## BRIEF DESCRIPTION OF THE DRAWINGS

## [0011]

Fig. 1 is a prospective view of a mop in accordance with an embodiment of this invention;

Fig. 2 is a side view of a bottom portion of the mop of fig. 1;

Fig. 3 is a back view of the portion of the mop seen in fig. 2;

Fig. 4 is a top view of the portion of the mop seen in fig. 2;

Figs. 5-7 are side views of three alternative positions of a central portion of the mop of fig. 1;

Fig. 8 is an plan view of the actuator of the mop of fig. 1;

Fig. 9 is a top view of the mop head of fig. 8;

Fig. 10 is a side view of the mop head of fig. 8;

Fig. 11 is a side view of an alternate position of the portion of the mop seen in fig. 2;

Fig. 12 is an elevational view of a removable tab that can be used in connection with the mop head of figs. 9 and 10;

Figs. 13-15 are perspective views showing the attachment of the tab of fig. 12 to the mop head of figs. 9 and 10;

Fig. 16 is a front view showing the use of the mop head of figs. 13-15 in a traditional mop;

Fig. 17 is a front view of one end of the connector used in the mop of fig. 1;

Fig. 18 is a side view of the end of the connector shown in fig. 17;

Fig. 19 is an end view of the end of the connector shown in fig. 17;

Fig. 20 is a side view of another alternate position of the portion of the mop seen in fig. 2;

Fig. 21 is a perspective view of the bottom portion of the mop of fig.1 with the removable brush removed and the mop head removed; and

Fig. 22 is a side view of the removable brush used in the mop of fig. 1.

#### DETAILED DESCRIPTION OF THE INVENTION

**[0012]** One embodiment of the mop that is the subject of this invention is shown in fig. 1. The components of the mop 10 are a handle 12, an actuator 14 on the handle, a mop head 16, and a connector 18 connecting the actuator and the mop head.

**[0013]** The handle 12 of the mop 10 that has been illustrated includes an upper section 20, an angled lower section 22, and a working end 24. The upper and lower sections need not be angled. The illustrated configuration places the actuator 14 at a relatively high position, however, and may provide a more comfortable hand position for the user. In the illustrated embodiment, the upper and lower sections of the handle are made of metal, and the working end is made of molded plastic. Other materials could also be used.

**[0014]** The working end 24 of the handle 12 that has been illustrated in fig. 2 includes two pairs of resilient arms 26 separated by a channel 28. Each set of resilient arms supports a set of rollers 30. The rollers 30 extend perpendicularly to the length of the handle. As illustrated, the arms and channel are angled with respect to the lower section 22 of the handle. Such arms need not be angled. However, the illustrated configuration places the mop head 16 in a desirable position with respect to the floor when used by a user.

**[0015]** Each of the sets of rollers 30 that have been illustrated includes three individual 3/4" diameter plastic rollers mounted on a metal bar 32 that extends through the two arms 26. A 2 3/4" long central roller 33 (fig. 3) is positioned between two roller supports 34 on each arm 26, and two similar 2 3/4" long outside rollers 35 are positioned on either side of the roller supports. As illustrated, the outside rollers have unsupported outer ends 36.

**[0016]** The actuator 14 that has been illustrated in figs. 5-8 is mounted on a connector 40 between the upper section 20 of the handle 12 and the angled lower section 22 of the handle. The actuator comprises a hand grip 42, an anchor 44, and a pivot 46 between the anchor and the hand grip. The actuator can be moved into position on the connector by sliding the pivot (fig. 8) up a 1/16" deep channel 47 on the connector, until it rests in pivot holes (not illustrated). The illustrated actuator and connector are made of plastic, but other materials could also be used.

**[0017]** As seen in fig. 8, the anchor 44 that has been

illustrated takes the form of a slotted mounting stem 48 that has an axis 50 that is parallel to the axes of the rollers 30. The illustrated mounting stem has a diameter of approximately 1/4", with a 1/16" wide slot 51.

**[0018]** The pivot 46 allows the actuator 14 to be moved between the wringing position seen in fig. 5, an intermediate position seen in fig. 6, and a replacement position seen in fig. 7. The illustrated hand grip 42 is about 3 1/2" from the pivot, and the anchor is about 1 3/4" from the pivot. This proportional distance has been found to be useful, but other proportions may also be used. It would also be possible to place both the anchor and the hand grip on the same side of the pivot, although this may not be as desirable.

**[0019]** As seen in figs. 9 and 10, the mop head 16 comprises a sponge 60 held by a rigid sponge holder 62. The illustrated sponge holder is made of stamped metal, and has two identical sides 64 that are spaced apart at a distance that is only slightly greater than the distance between the rollers 30. As illustrated, the sides of the sponge holder are about 3/4" apart at their widest point, and the rollers are about 5/8" apart. Each side of the sponge holder has upper and lower projections 66 and 68 that extend outwardly from the sides. The upper projections 66 that have been illustrated project about 1/16" from the sides. When the actuator 14 is in the intermediate position seen in fig. 6, the upper projections 66 engage an upper portion 38 of the rollers (fig. 2), and thus help to secure the mop head to the handle 12. The lower projection 68 that is shown on the sides of the sponge holder may also help to restrain the sponge holder from moving upwardly with respect to the rollers when a user is pressing down on the mop.

**[0020]** As best seen in fig. 4, the illustrated upper projections 66 are spaced at least about an inch and a half from the midpoint of the mop head 16, and thus contact only the outside rollers 35. This arrangement is beneficial because the unsupported outer ends 36 of the outside rollers provide some resiliency, making it easier for a user to push the projections past the rollers so the mop head can move from the intermediate position illustrated in figs. 2-4 to the replacement position illustrated in fig. 11.

**[0021]** To enable the mop head 16 to be used with the illustrated connector 18, the sponge holder 62 has a bridge 70 (figs. 9 and 10) between lateral edges 71 of the sponge holder, and two shoulders 72 beneath the bridge. The bridge that has been illustrated is about 3/4" wide and is disposed about 1/4" above the 3/8" wide shoulders.

**[0022]** To increase the usefulness of the mop head 16, the illustrated bridge also includes a 1/4" diameter threaded aperture 74 that permits use of the mop head in other types of sponge mops. The illustrated sponge holder 62 also includes spaced-apart slots 76 with a 3/8" diameter circular section 77 adjoining an extended 7/32" wide passage 78. The slots may be provided with removable ring tabs 100, such as the one seen in fig. 12.

The illustrated tabs 100 have a stalk 102 with a groove 104. The illustrated stalk has approximately the same diameter as the circular section of the slots.

**[0023]** The illustrated keyhole configuration of the slots 76 permits the ring tabs 100 to be removably attached to the sponge holder 62. As seen in figs. 13 and 14, the stalk 102 of the tabs 100 is first inserted into the circular section 77 of the sponge holder. The tabs are then moved inwardly, as seen in figs. 14 and 15, with the edges of the passage 78 sliding in the groove 104. There, the tabs can be used to secure the wires 105 used on conventional mops 107, as seen in fig. 16, enabling the mop head to be used in those other mops.

**[0024]** In the embodiment of the invention illustrated in fig. 1, the connector 18 links the actuator 14 to the mop head 16. The connector that has been illustrated is a 3/16" diameter metal rod that passes through a guide 80 in the working end 24 of the handle, as seen in fig. 3. As seen in figs. 17-19, the lower end of the connector includes a 1 1/4" long arm 82 with an angled tip 83. When installed in the mop, the arm extends parallel to the opposed rollers 30.

**[0025]** At its other end, the connector 18 preferably includes a loop 84 (figs. 5-7) that enables the connector to be press-fit over the slotted mounting stem 48 on the actuator 14. The slot 51 in the stem enables the stem to deflect inwardly, permitting the loop to pass over the upper edges of the stem. The disposition of the mounting stem in parallel with the rollers 30, and the positioning of the connector through the guide 80 on the working end 24 help to limit undesirable side-to-side movement of the connector, while permitting modest rotation of the connector about the axis 50 of the mounting stem. This modest rotation facilitates movement of the actuator through the full range of alternative positions.

**[0026]** When the actuator 14 is in the replacement position illustrated in fig. 7, the connector 18 extends downwardly between the rollers 30, as seen in fig. 11. In this position, the mop head 16 is free of the rollers and thus can be readily attached to or removed from the connector. In the illustrated mop, the mop head can be attached or removed by simply moving it parallel to the rollers. To attach the mop head, the angled tip 83 of the arm 82 of the connector (figs. 17-19) is inserted between the shoulders 72 on the sponge holder 62 and the bridge 70 (figs. 9 and 10). The angled tip can facilitate insertion if parts of the sponge 60 are found in the space between the bridge and the shoulders. To remove the mop head, it is simply moved in the opposite direction.

**[0027]** After the mop head 16 is attached to the connector, moving the actuator 14 to the intermediate position seen in fig. 6 pulls the connector 18 upwardly, drawing the sponge holder 62 upwardly between the rollers 30 to the position seen in fig. 2. This position is useful for mopping. In the illustrated mop, interference between the upper corners 67 of the sponge holder and the rollers provides some resistance to movement of the sponge holder from the replacement position to the in-

termediate position. However, sufficient pressure on the actuator will cause the resilient arms 26 to deflect sufficiently to enable the comers and the projections 66 to pass between the rollers. After the comer and projections pass the midpoint of the rollers, the resiliency of the arms can press the sponge holder further upward, effectively snapping it into a position where further upward movement is resisted by lower portions 39 of the rollers engaging either the lower projections 68 on the sponge holder or the sponge 60, and downward movement is resisted by engagement of the upper projections 66 against the upper portions 38 of the rollers.

**[0028]** Pushing the actuator 14 from the intermediate position seen in fig. 6 to the wringing position seen in fig. 5 draws the sponge element 60 between the rollers 30 to the position seen in fig. 20, wringing the mop. As the mop head 16 moves upwardly, the sponge holder 62 moves upwardly through the channel 28 between the arms 26. The uppermost edge 90 of the channel 28 provides a limit to the upward movement of the mop head, preventing the mop head from being accidentally drawn too far upwardly. If the mop head were drawn too far upwardly, it might be difficult to return the mop to the intermediate position for further use. As illustrated, the uppermost edge of the channel is disposed about 2" above the plane of the rollers 30.

**[0029]** For further convenience, the working end 24 of the mop can be provided with a removable brush 92. The brush illustrated in fig. 22 has a slotted resilient web 93 that fits within a sleeve 95 on the working end of the mop (fig. 21). The web comprises a depression 97 that engages an internal knob 99 in the sleeve to hold the brush in position.

**[0030]** This description of one embodiment of a mop has been provided only for descriptive purposes. Those skilled in the art will appreciate that many modifications can be made to the disclosed embodiment without departing from the spirit or scope of the invention, which is set forth in the following claims.

## Claims

### 1. A mop comprising:

- a handle with a working end;
- a pair of opposed rollers extending perpendicularly to the handle;
- a mop head comprising a sponge and a sponge holder;
- an actuator on the handle, the actuator being movable between a wringing position, an intermediate position, and a replacement position; and
- a connector linking the actuator to the sponge holder so that the sponge element is between the rollers when the actuator is in the wringing position, and the sponge head is free of the roll-

- ers when the actuator is in the replacement position.
2. The mop as recited in claim 1, in which the connector is a rod, and the working end of the handle includes a guide for the rod. 5
  3. The mop as recited in claim 1, in which:
    - the sponge holder comprises a shoulder and a bridge; 10
    - the connector comprises an arm parallel to the rollers that fits under the bridge and above the shoulder; and
    - the mop head is removable from the connector by moving the mop head parallel to the rollers when the mop head is free of the rollers. 15
  4. The mop as recited in claim 3, in which the arm on the connector has an angled tip. 20
  5. The mop as recited in claim 1, in which the sponge holder comprises two sides, at least one of the sides comprising an upper projection that engages an upper portion of one of the rollers when the actuator is in the intermediate position. 25
  6. The mop as recited in claim 5, in which the sponge holder comprises upper projections on each side. 30
  7. The mop as recited in claim 5, in which:
    - at least one of the rollers comprises at least two outside rollers with unsupported outer ends; 35
    - the side of the sponge connector comprising the upper projection comprises two upper projections, each upper projection contacting only one of the outside rollers.
  8. The mop as recited in claim 1, in which at least one of the rollers is at least partially mounted on a resilient arm. 40
  9. The mop as recited in claim 1, in which the actuator comprises a hand grip, an anchor, and a pivot between the anchor and the hand grip. 45
  10. The mop as recited in claim 1, in which the connector comprises a rod and is connected to the actuator at a mounting stem that has an axis that is perpendicular to the handle. 50
  11. The mop as recited in claim 1, in which the connector comprises a rod with a loop that is connected to a slotted mounting stem on the actuator. 55
  12. The mop as recited in claim 11, in which the slotted mounting stem has an axis that is perpendicular to the handle.
  13. The mop as recited in claim 1, in which the handle has an upper section and an angled lower section.
  14. The mop as recited in claim 13, in which the actuator is mounted on a connector between the upper section of the handle and the angled lower section of the handle.
  15. The mop as recited in claim 13, in which the working end of the handle has a channel that is angled with respect to the lower section of the handle.
  16. The mop as recited in claim 1, in which:
    - the working end of the mop comprises a sleeve with an internal knob; and
    - the mop further comprises a removable brush with a slotted resilient web that engages the internal knob.
  17. The mop as recited in claim 1, in which the mop head comprises a shoulder on the sponge holder and a bridge that is disposed at least about 3/16 of an inch above the shoulder.
  18. The mop as recited in claim 1, in which the sponge holder comprises two sides, each of the sides comprising two upper projections spaced at least about an inch and a half from the midpoint of the mop head.
  19. The mop as recited in claim 1, in which the mop head comprises a shoulder on the sponge holder, a bridge disposed above the shoulder, and a threaded aperture in the bridge.
  20. The mop as recited in claim 1, in which the mop head comprises a bridge on the sponge holder, a threaded aperture in the bridge, a pair of spaced-apart slots, each slot having a circular section adjoining a narrower passage, and a pair of removable tabs that fit within the slots.
  21. A mop head comprising a sponge element and a sponge holder, the sponge holder comprising a shoulder, a bridge disposed above the shoulder, and a threaded aperture in the bridge.
  22. A mop head as recited in claim 21, in which the sponge holder further comprises a pair of spaced-apart slots, each slot having a circular section adjoining a narrower passage, and a pair of removable tabs that fit within the slots.
  23. A mop head comprising a sponge element and a sponge holder, the sponge holder comprising a

bridge, a threaded aperture in the bridge, a pair of spaced-apart slots, each slot having a circular section adjoining a narrower passage, and a pair of removable tabs that fit within the slots.

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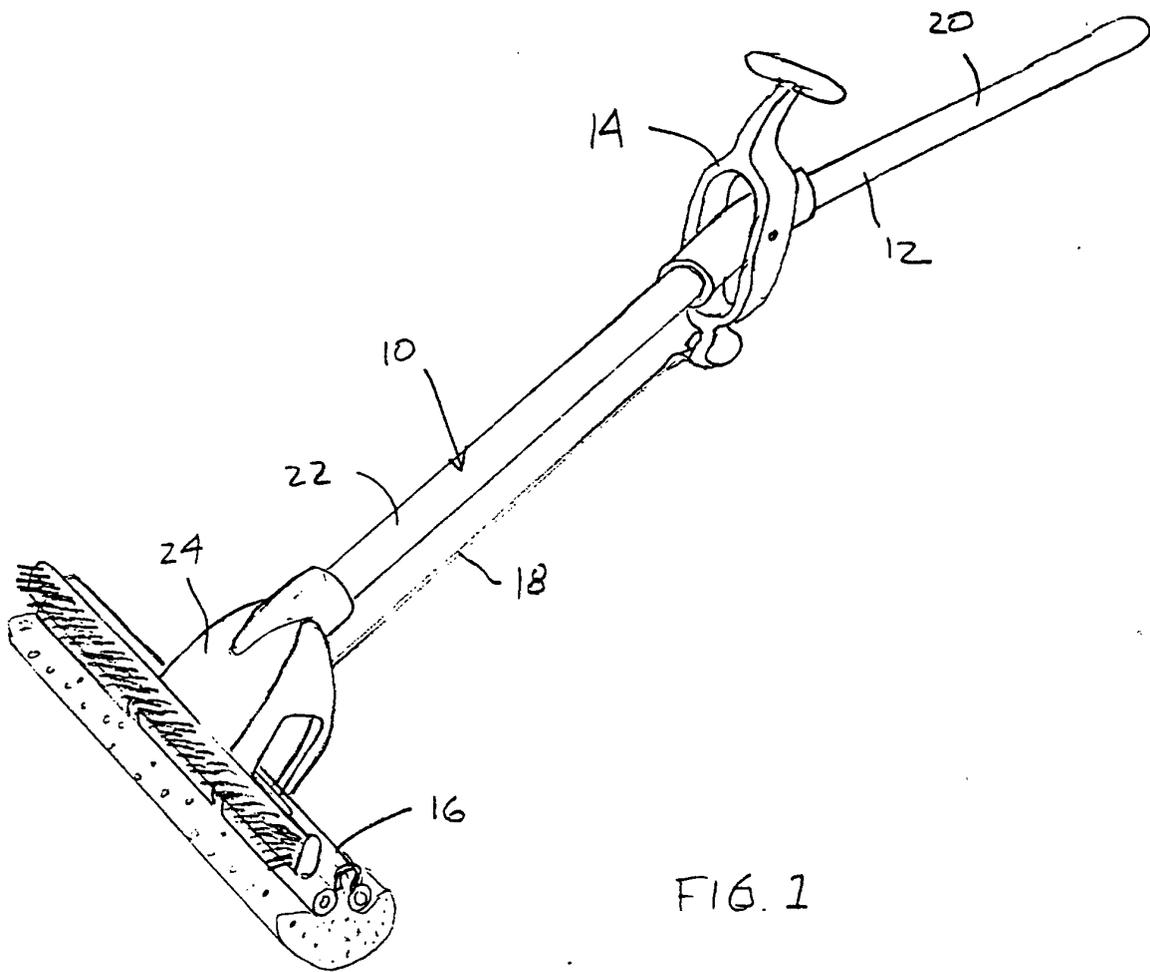
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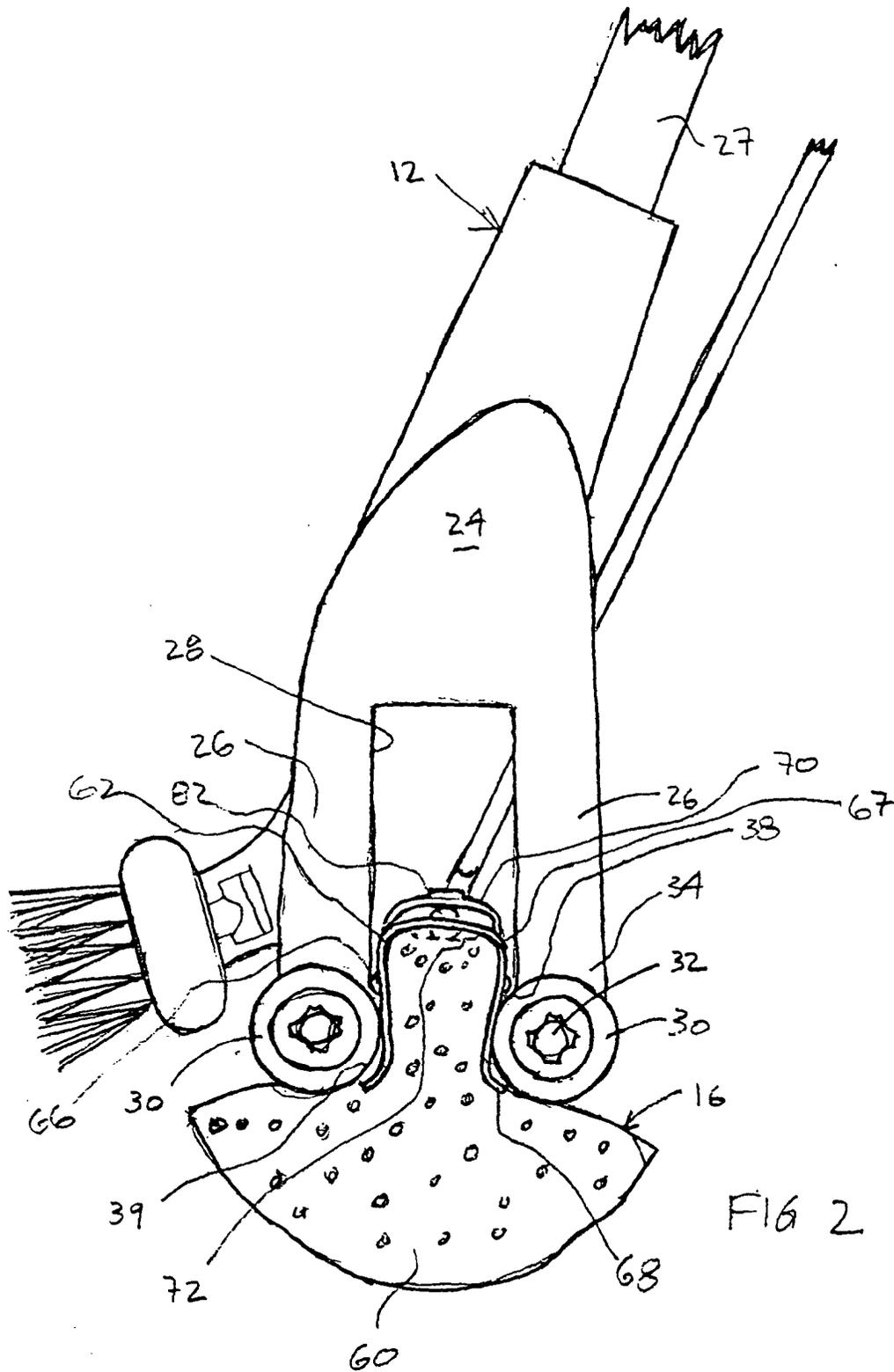
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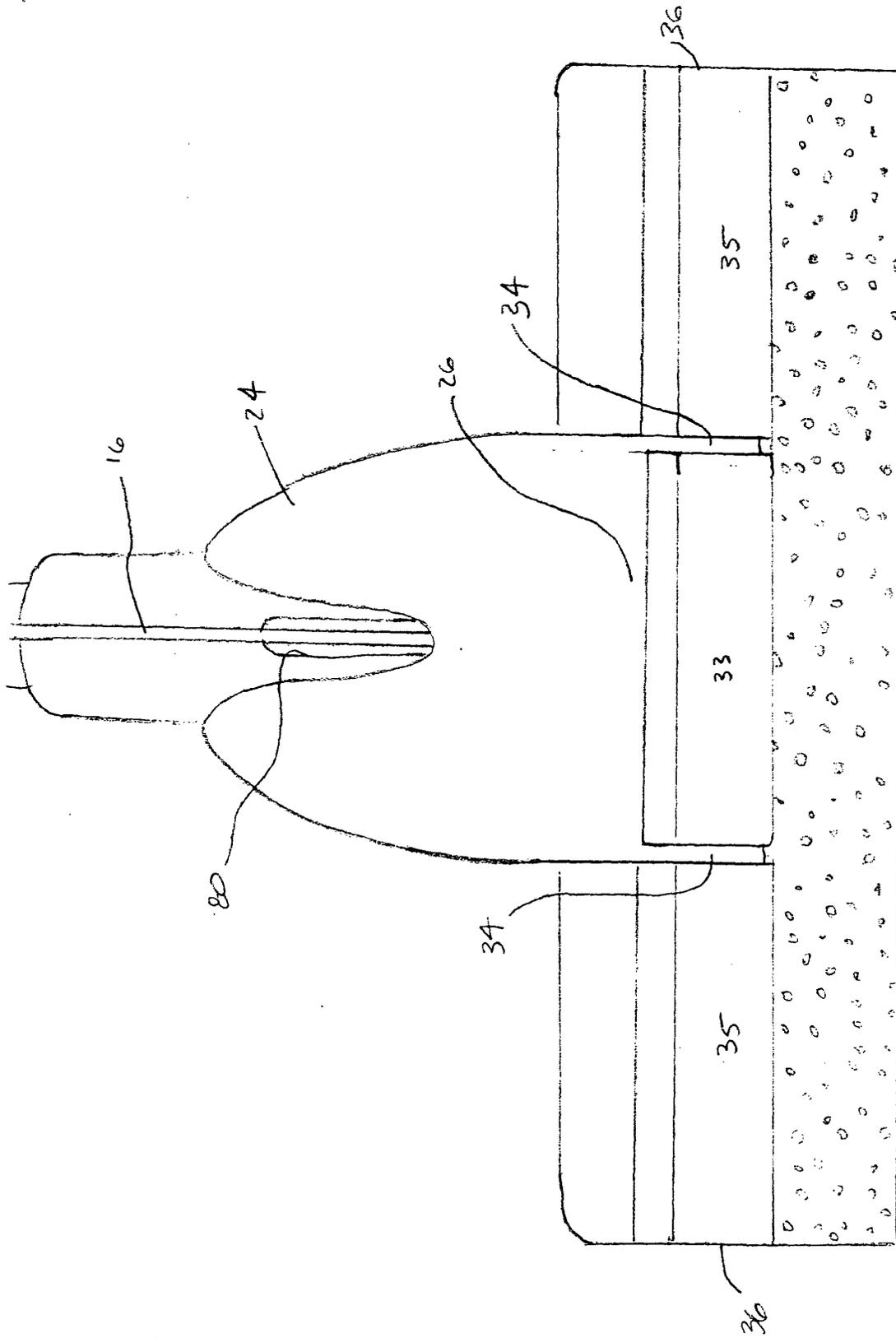


FIG. 3

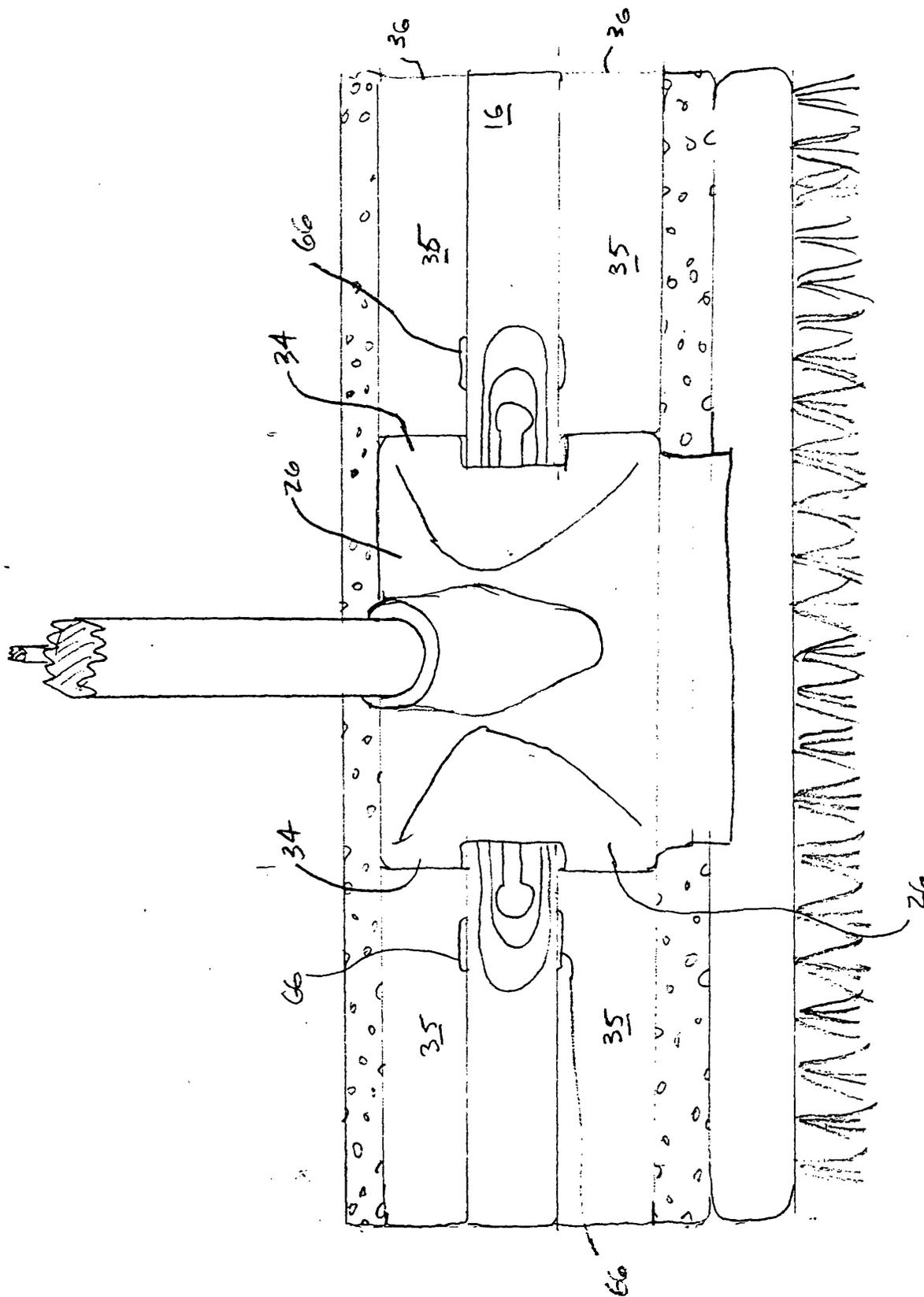


FIG. 4

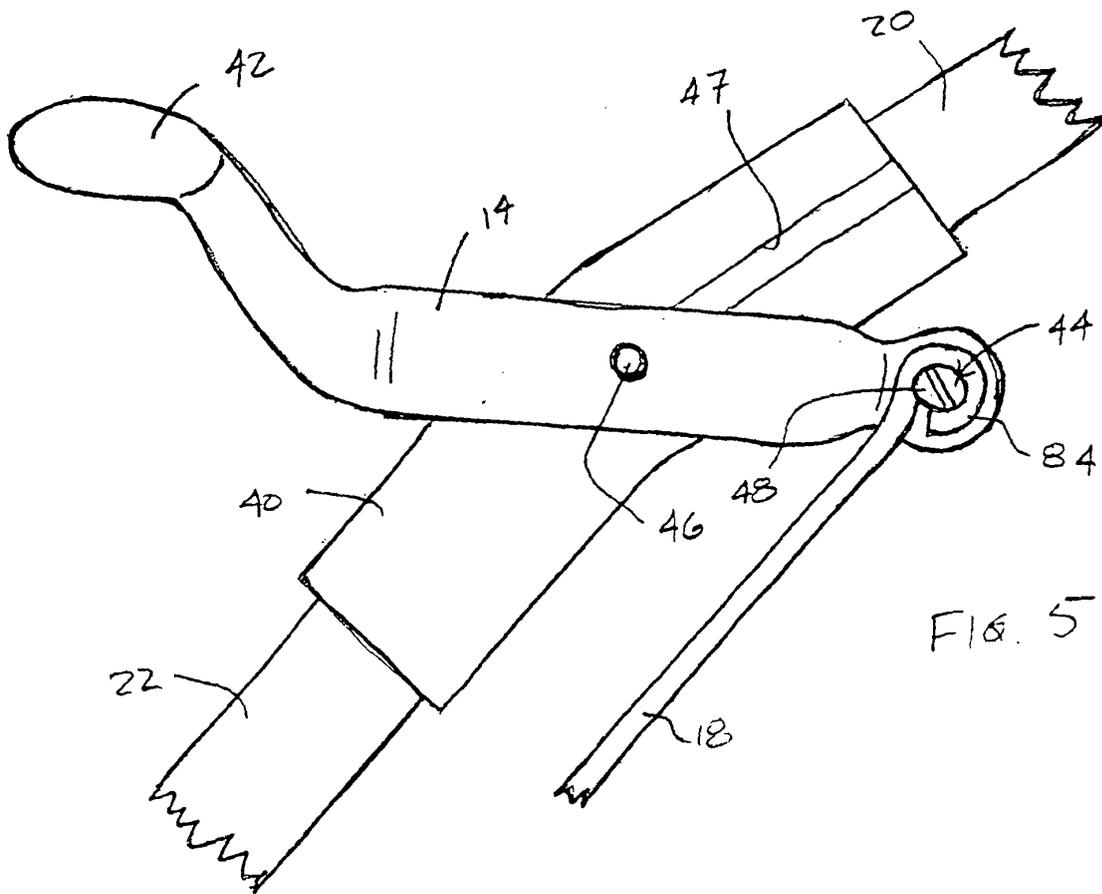


FIG. 5

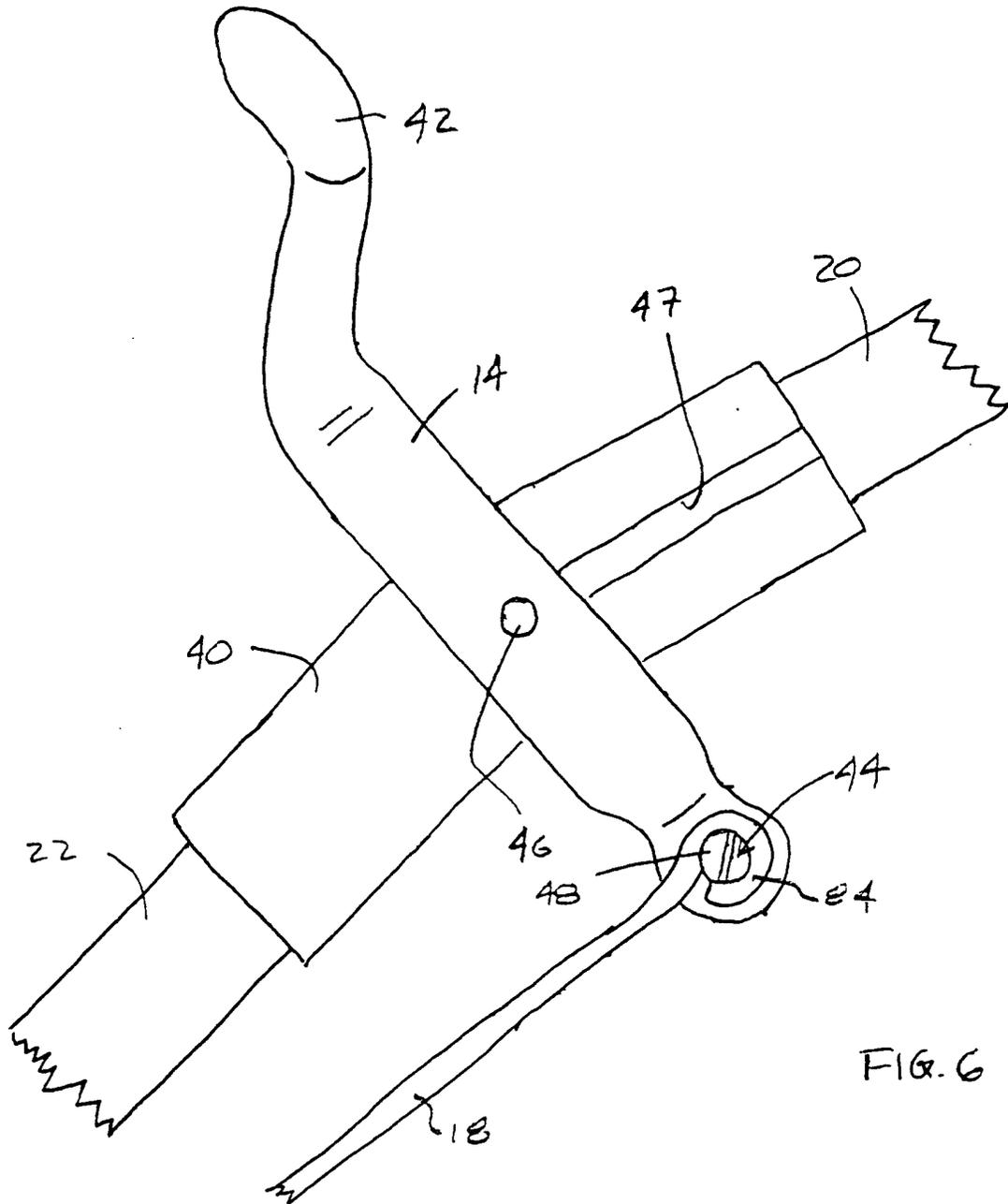
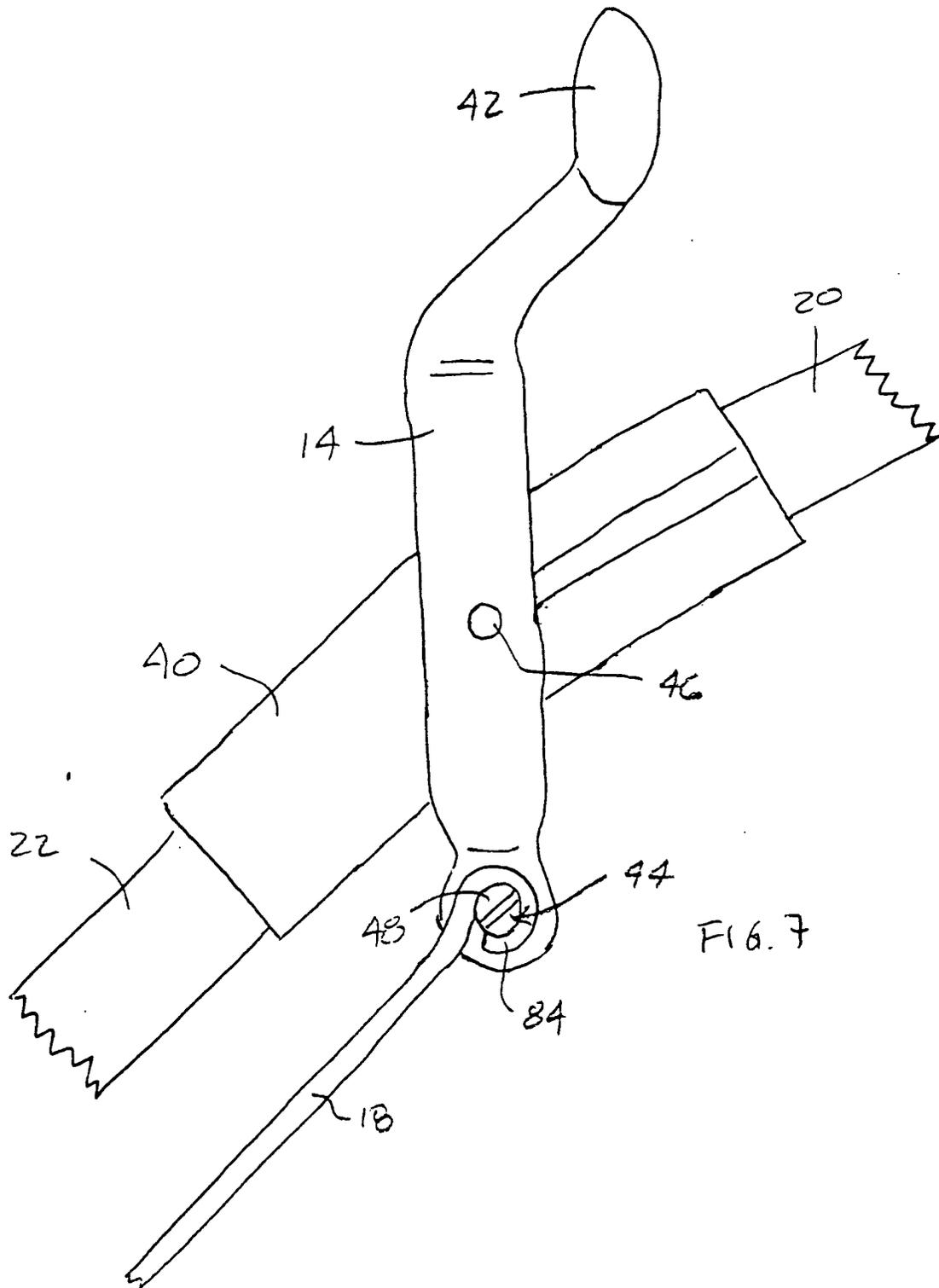
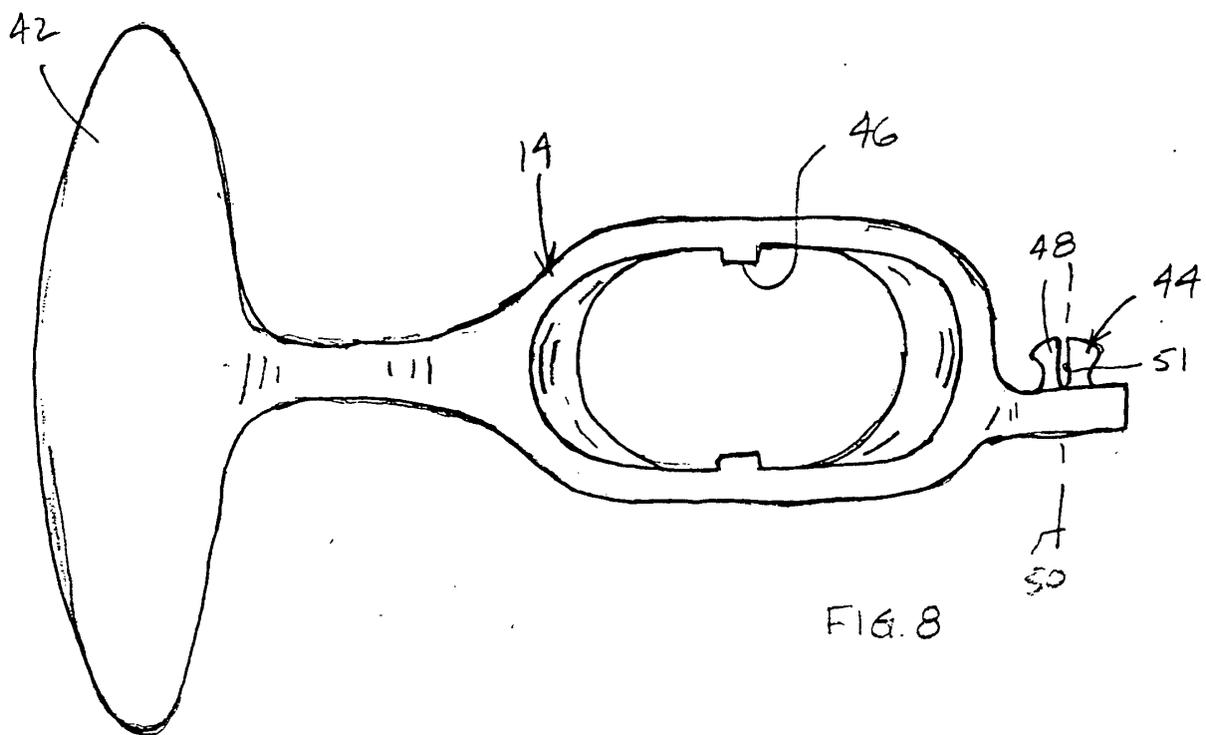
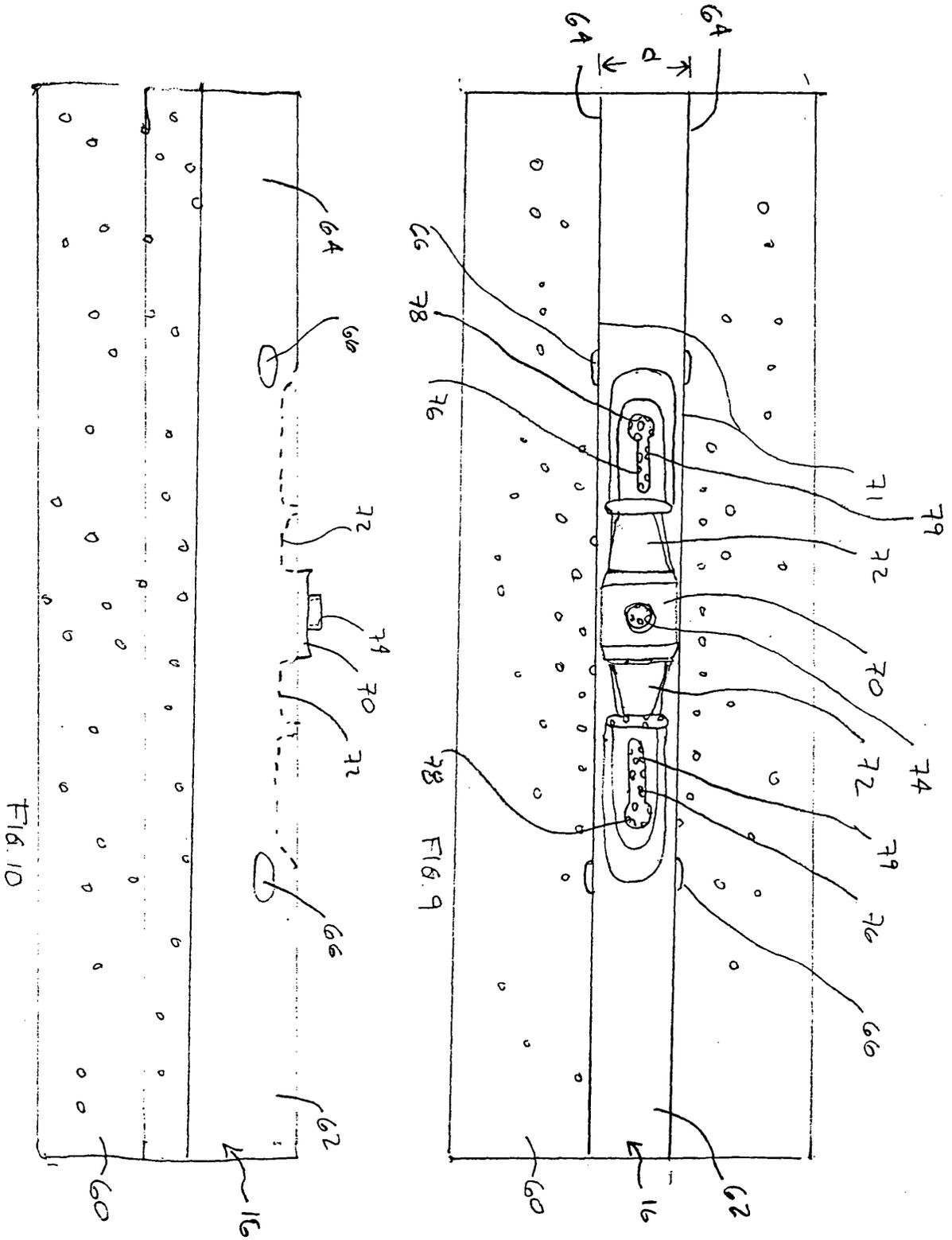


FIG. 6







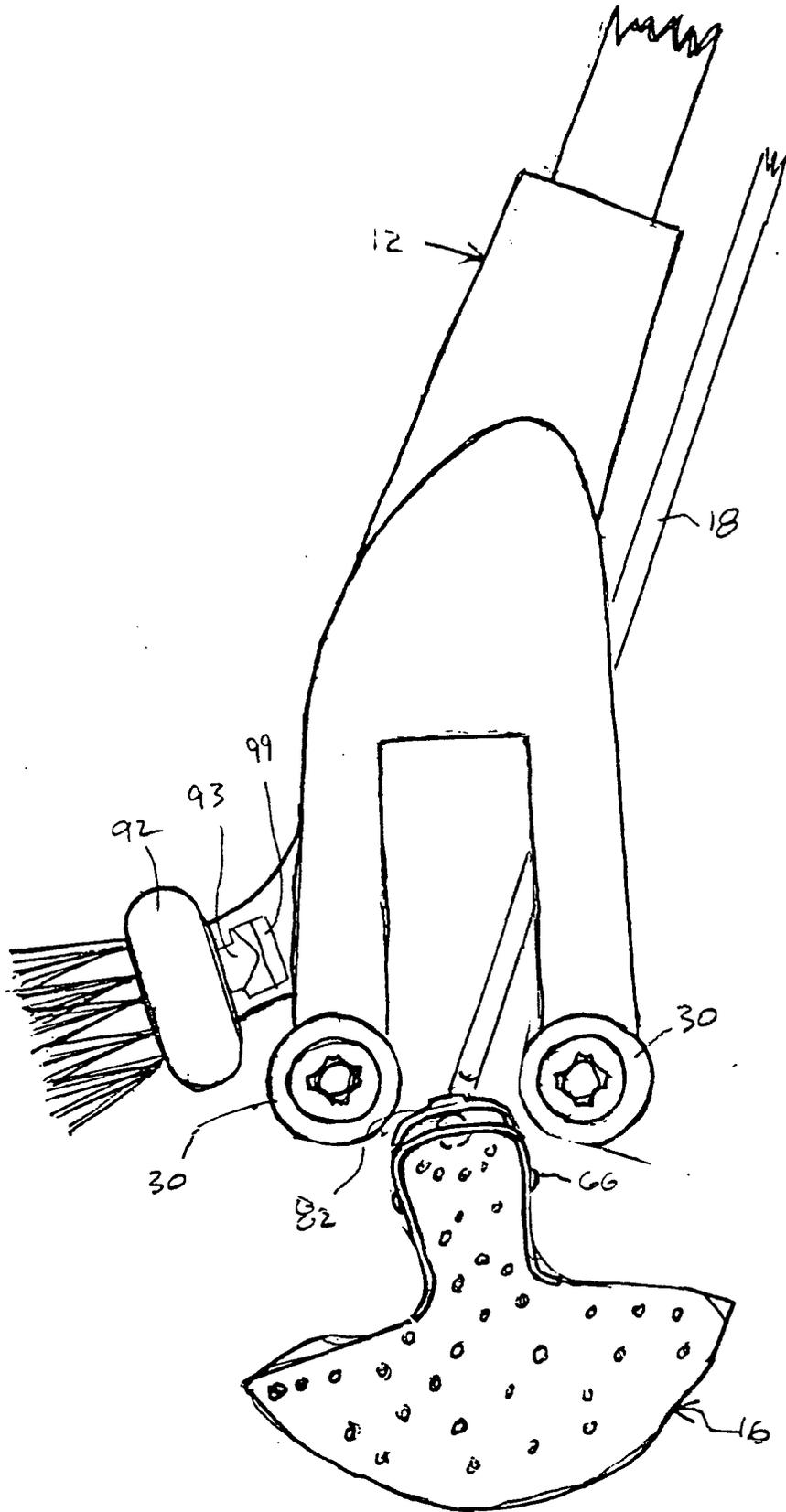
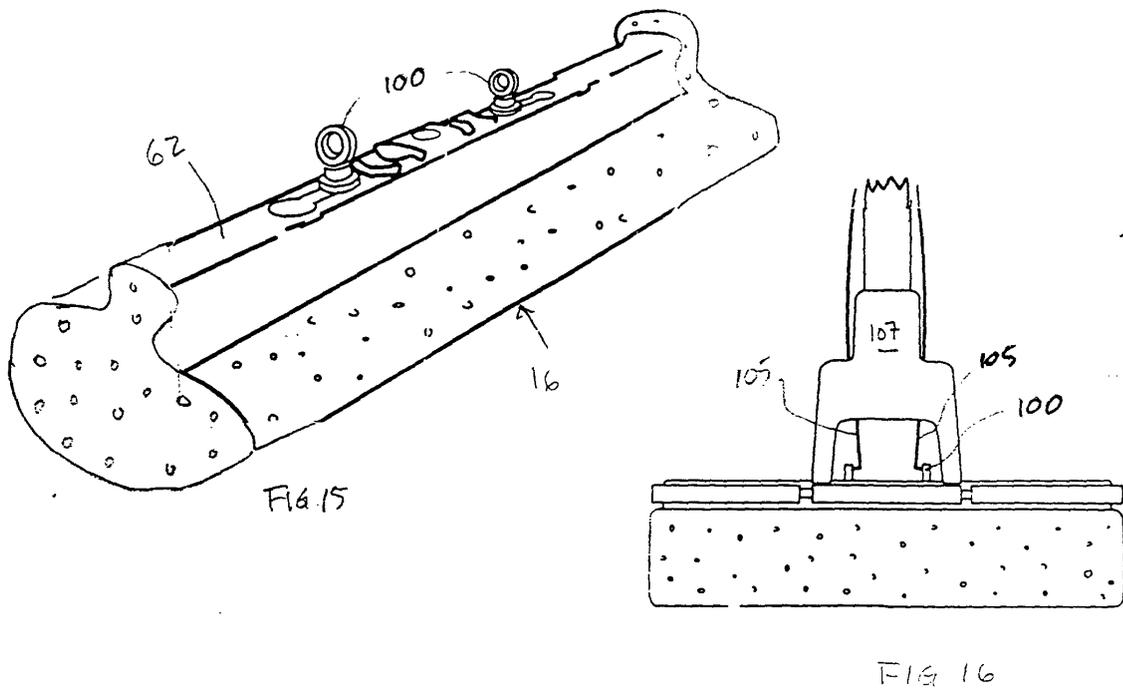
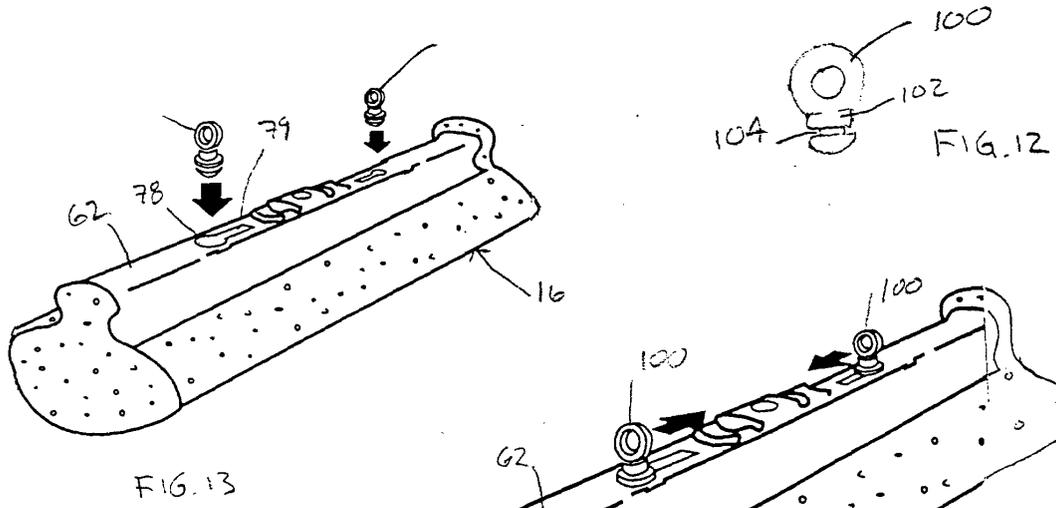


FIG. 11



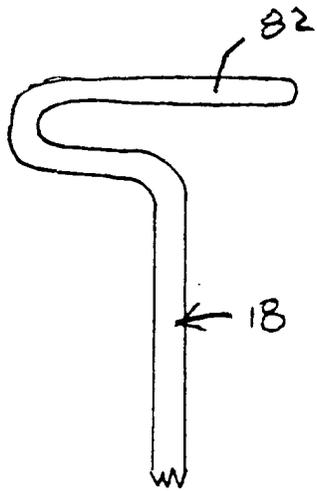


FIG. 17

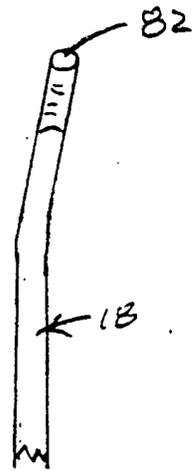


FIG. 18

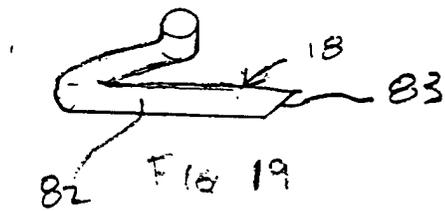
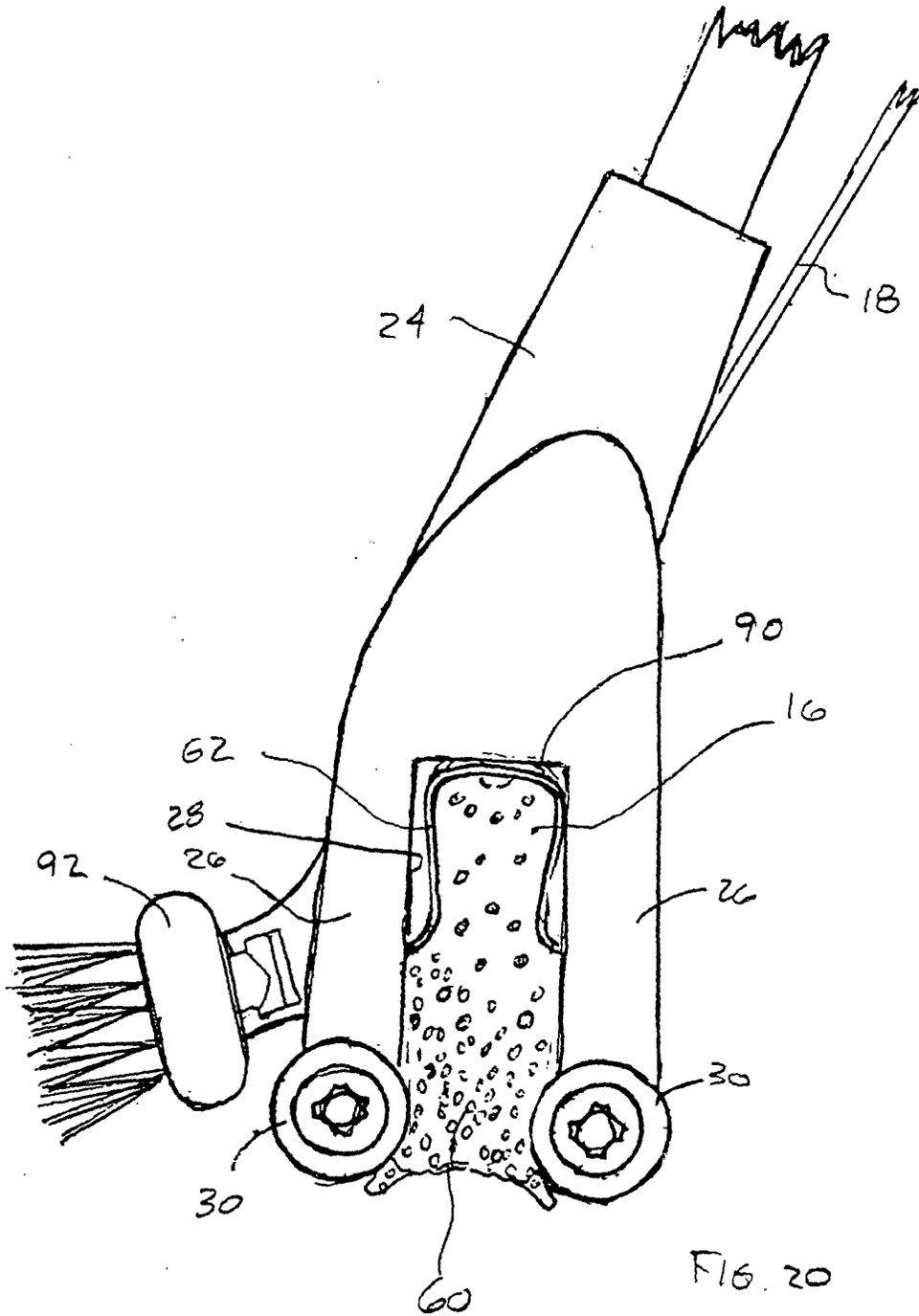
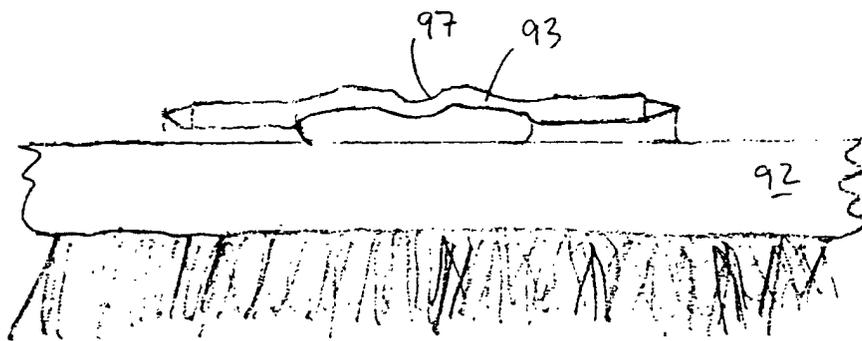
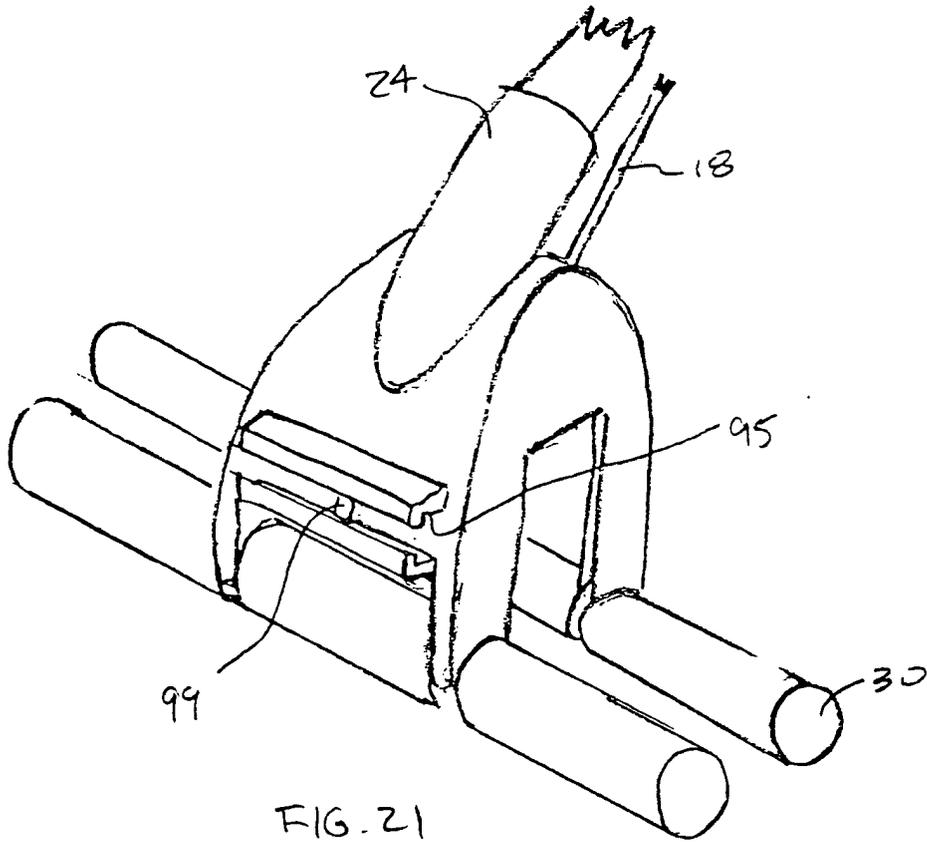


FIG. 19







European Patent  
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EUROPEAN SEARCH REPORT

Application Number  
EP 00 12 6195

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 3 727 259 A (WILSON F) 17 April 1973 (1973-04-17) * abstract * * column 2, line 35 - line 58 * * column 4, line 1 - line 52 * * figures *	1-3, 9-12, 17	A47L13/144 A47L13/12
Y	---	13-16, 19	
X	US 5 097 561 A (TORRES B) 24 March 1992 (1992-03-24) * abstract * * column 3, line 57 - line 63 * * column 4, line 1 - line 3 * * column 4, line 4 - column 5, line 17 * * column 5, line 51 - line 68 * * column 6, line 1 - line 55 * * figures *	1, 2, 9-12	
X	DE 12 93 983 B (RE E; RE C) 30 April 1969 (1969-04-30) * claims * * figures *	1, 8-12	
Y	FR 2 767 465 A (FENG HSU HSIU) 26 February 1999 (1999-02-26) * abstract * * figures *	13-15	
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X	---	21	
		-/--	
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		13 July 2001	Cabra1 Matos, A
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPC FORM 1503 03 82 (P04001)



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EUROPEAN SEARCH REPORT

Application Number  
EP 00 12 6195

DOCUMENTS CONSIDERED TO BE RELEVANT			
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A	US 1 509 731 A (DUNCAN K) 23 September 1924 (1924-09-23) * figures 1-3 * -----	9	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
Place of search THE HAGUE		Date of completion of the search 13 July 2001	Examiner Cabral Matos, A
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