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(54) Sweeping and wringing apparatus

(57) The present invention is related to a sweeping and wringing apparatus, comprising: a handle (10); a moving bar (20), having an upper end that is hingedly connected with said handle (10) at a middle position thereof and a lower end that is placed inside said handle (10) at a lower position thereof; a transmission rod (30), glidingly mounted within said handle (10) and having an upper end that is hingedly connected with said lower end of said moving bar (20), a frame (40), having a vertical part with an upper end that is attached to said handle (10) at a lower end thereof and a horizontal part with two far ends that define left and right sides; a pair of hinge plates (50), having an upper end that is hingedly connected with one of said far ends of said horizontal part of said frame (40) and having a bent part with a bolt; a pulling element (60), attached to said lower end of said transmission rod (30); a pair of holding plates (70), having vertical ribs with inner ends that are hingedly connected with said pulling element (60) and extending symmetrically to the left and right, respectively; and a cleaning head (100), fastened to said pair of holding plates (70), comprising a positioning plate and a cleaning element (90) fastened to said positioning plate on a lower side thereof.

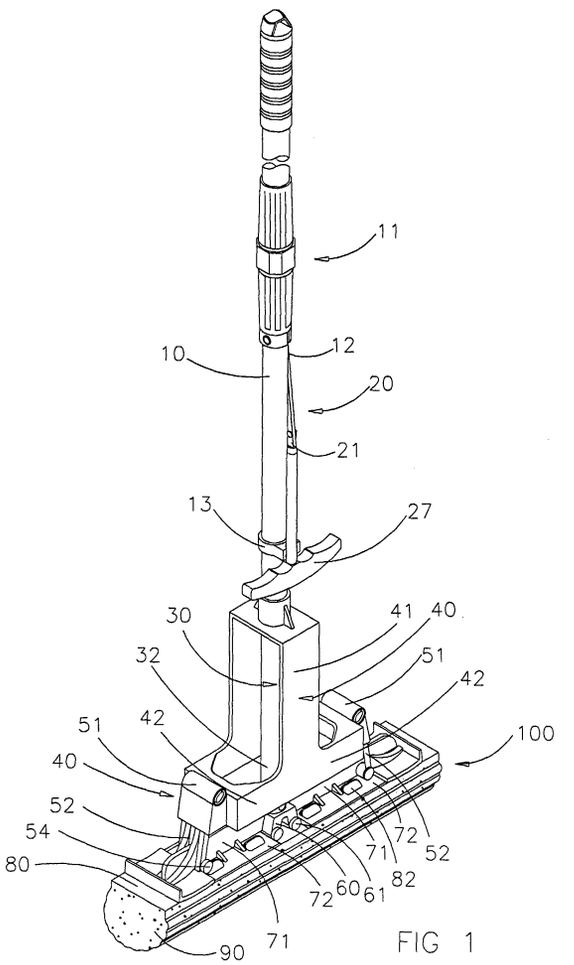

FIG 1

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Description

Field of the invention

[0001] The present invention is related to a sweeping and wringing apparatus, particularly to a sweeping and wringing apparatus which allows to be effectively wrung dry in an inward folding squeezing movement.

Description of Related Art

[0002] Conventionally, for wet-cleaning a floor, a sweeper with a long handle is used to avoid to have to bend down during the cleaning work. The handle has a front end to which a cleaning element is attached, which is a piece of cloth or a sponge. However, this kind of sweeper does not have a device allowing to wring the cleaning element dry, so after the cleaning work the cleaning element has to be wrung dry by hand or by stepping thereon by foot, which is inconvenient.

[0003] To counter this difficulty, a sweeping and wringing apparatus with a cleaning element that allows to be squeezed has been brought on the market, mainly comprising, as shown in Fig. 13: a handle 1; a sponge 2; a connecting piece 3, attached to a lower end of the handle 1; a gripping element 4, made of punched metal and gripping an upper part of the sponge 2; a connecting rod assembly 5, having L-shaped elements fastened to the gripping element 4, for transmitting a downward movement to the sponge 2; a pair of roll bars 6, attached to a lower side of the connecting piece 3; and a lever 7, connected with the connecting rod assembly 5. When the lever 7 is lifted, the connecting rod assembly 5 is pulled up, dragging upward the sponge 2, which is subsequently squeezed between the pair of roll bars 6, so that water contained in the sponge 2 is wrung out.

[0004] This conventional sweeping and wringing apparatus allows to press out water contained therein, but has the following shortcomings :

1. For pressing out water, the sponge 2 is drawn through the roll bars 6. The surface of the sponge 2 that is pressed is comparatively small. In practice, pulling up of the lever 7 is often done fast, with the sponge 2 rapidly slipping through between the roll bars 6, so that the sponge 2 is not wrung dry.
2. The sponge 2 is held by the gripping element 4 and fastened to the connecting rod assembly 5 by a screw 8. After prolonged use, however, the surface of the sponge 2 becomes dirty and the screw 8 becomes rusty to the point of the sponge 2 not being replaceable.
3. Since the sponge 2 is held fastened to the connecting rod assembly 5 by the screw 8, mounting and dismounting thereof has to be performed by a tool or a machine, which is inconvenient and expensive and also impractical during use.

SUMMARY OF THE INVENTION

[0005] It is an object of the present invention to provide a sweeping and wringing apparatus which is good-looking and effective.

[0006] Another object of the present invention is to provide a sweeping and wringing apparatus having a cleaning element that is easily replaceable.

[0007] A further object of the present invention is to provide a sweeping and wringing apparatus which is easily wrung dry and which is inexpensively manufactured.

[0008] A further object of the present invention is to provide a sweeping and wringing apparatus which is convenient to assemble and disassemble.

[0009] The present invention can be more fully understood by reference to the following description and accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] Fig. 1 is a perspective view of the sweeping and wringing apparatus of the present invention in the regular state.

[0011] Fig. 2 is a schematic illustration of the sweeping and wringing apparatus of the present invention with the cleaning head dismounted and the transmission rod not pulled up (regular state).

[0012] Fig. 3 is a schematic illustration of the sweeping and wringing apparatus of the present invention with the cleaning head mounted and the transmission rod pulled up halfway.

[0013] Fig. 4 is a schematic illustration of the sweeping and wringing apparatus of the present invention with the cleaning head dismounted and the transmission rod pulled up halfway.

[0014] Fig. 5 is a schematic illustration of the sweeping and wringing apparatus of the present invention with the cleaning head dismounted and the transmission rod completely pulled up.

[0015] Fig. 6 is a schematic illustration of the movement of the moving bar of the present invention.

[0016] Fig. 7 is a perspective schematic illustration of the wringing system of the present invention at the lower part thereof.

[0017] Fig. 8 is a perspective view of the cleaning head of the present invention.

[0018] Fig. 9 is a cross-sectional schematic illustration mounting of the cleaning head on the pair of holding plates of the present invention.

[0019] Fig. 10 is a schematic illustration of the cleaning head of the present invention in the second embodiment.

[0020] Fig. 11 is a schematic illustration of the cleaning head of the present invention in the third embodiment.

[0021] Fig. 12 is a schematic illustration of the cleaning head of the present invention in the fourth embodi-

ment.

[0022] Fig. 13 is a perspective view of a conventional sweeping and wringing apparatus.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0023] As shown in Figs. 1 - 8, the sweeping and wringing apparatus of the present invention comprises: a handle 10; a moving bar 20; a transmission rod 30; a frame 40; a pair of hinge plates 50, defining left and right sides; a pulling element 60; a pair of holding plates 70; and a cleaning head 100. The handle has a lower end to which the frame 40 is attached. The pair of hinge plates 50 are hingedly connected with opposite lower ends of the frame 40. The moving bar 20 is connected with the handle 10 and is used to drive a wringing movement. The transmission rod 30 runs inside the handle 10, being connected with the moving bar 20. The pulling element 60 is attached to the transmission rod 30. The pair of holding plates 70 extend to the left and right, being hingedly connected with and driven by the pulling element 60. The cleaning head 100 is mounted on a lower side of the pair of holding plates 70 and has an upper surface connected with the pair of hinge plates 50, thus being driven thereby in a squeezing movement.

[0024] The handle 10 is manually gripped at, having an upper end with an adjusting device 11 for adjusting the length of the handle 10. The adjusting device 11 is conventional art and therefore not described further. The handle 10 has an inner space which accommodates the moving bar 20 and the transmission rod 30.

[0025] As shown in Fig. 6, the moving bar 20 has an upper rod 21 and a lower rod 22, which is connected with the upper rod at a middle position thereof. Furthermore, the moving bar 20 has an upper end 23, which is hingedly connected with the handle at a middle position thereof. The lower rod 22 has a lower end 25, which is hingedly connected with the handle at a lower position thereof and with the transmission rod 30, driving the transmission rod 30. The upper rod 21 and the lower rod 22 partly pass through an opening 12 of the handle 10. The upper rod 21 has a far end carrying a grip 27 that allows manually to pull out the moving bar 20. In a regular state, the upper rod 21 is held close to the handle 10 by an elastic clasp 13.

[0026] As shown in Figs. 4 and 6, the transmission rod 30 is partly accommodated in the handle 10, being able to glide therein upward and downward. The transmission rod 30 has an upper end 31, which is hingedly connected with the lower end 25 of the lower rod 22, and a lower end 32, which is connected with the pulling element 60, driving the pulling element 60 upward.

[0027] The frame 40 is a hollow body, shaped like the inverted letter T, having a vertical part 41 connected with the lower end of the handle 10 and a horizontal part 42 with two far ends that extend away from the vertical part 41 to the left and right.

[0028] Referring to Fig. 7, each of the pair of hinge plates 50 has a shape like the letter L, with a top end through which a bolt 51 passes to establish a hinged connection with one of the far ends of the horizontal parts 42. Furthermore, each of the pair of hinge plates 50 has a bent part 52 with a bolt 54 for connecting with the pair of holding plates 70.

[0029] The pulling element 60, being roughly shaped like the inverted letter T, is fixed on the lower end 32 of the control rod 30 and has a bottom part with two pulling hinges 61 to the left and right.

[0030] The pair of holding plates 70 are in a symmetric arrangement hingedly connected with the pulling hinges 61, having roughly T-shaped cross-sections. Each of the pair of holding plates 70 has a vertical rib 71 with an inner end 73, which is hingedly connected with one of the pulling hinges 61, and an outer end having a slanted elongated hole 74, which accommodates the bolt 54 of the bent part 52 of one of the hinge plates 50. Furthermore, each of the pair of holding plates 70 has a horizontal plate 72, which is provided with a plurality of holes 75 for holding the cleaning head 100.

[0031] Referring again to Figs. 1 and 6, in the regular state, when the upper rod 21 of the moving bar 20 has not been pulled on, the upper rod 21 does not move the lower rod 22, so that no upward force is exerted on the transmission rod 30.

[0032] The cleaning head 100 is fastened to the pair of holding plates 70 by screws or by clamping or binding means. This is conventional art and therefore not described further.

[0033] Referring to Figs. 3 and 4, when the upper rod 21 of the moving bar 20 is pulled away from the handle 10, the lower rod 22 is moved along, so that an upward force is exerted on the transmission rod 30, drawing the pulling element 60 upward, which in turn causes the pulling hinges 61 to pull up the holding plates 70 at the inner ends 73 thereof. Thereby, the pair of holding plates 70 folds inward around the pulling hinges 61, in turn folding the cleaning head 100.

[0034] Referring to Figs. 5 and 6, when the upper rod 21 of the moving bar 20 has reached an uppermost position, the transmission rod 30 has been drawn completely inside the handle 10, with the pair of holding plates 70 being completely folded together. Since the bolts 54 on the hinge plates 50 pass through the elongated holes 74 of the holding plates 70, the hinge plates 50 are drawn into the frame 40, as well. Thus the cleaning head 100 is folded and squeezed, so that water contained therein is readily wrung out.

[0035] Referring now to Figs. 1 - 3 and 7 - 9, the cleaning head 100 comprises a positioning plate 80 and a cleaning element 90, held on a bottom side of the positioning plate 80. The cleaning element 90 is shaped like a strip of material capable of sucking water, like a sponge, cloth or plastics material. The present description uses a sponge, but this does not restrict the range of embodiments.

[0036] The positioning plate covers the cleaning element 90 from above, exerting squeezing pressure thereon (as shown in Fig. 3) to wring out water.

[0037] As shown in Figs. 7 - 9 the positioning plate 80 has a base plate 81 made of soft material and a plurality of hooks 82 on a top side of the base plate 81. For mounting the cleaning head 100, peaks 83 of the hooks 82 are inserted into the plurality of holes 75 of the pair of holding plates 70 to be held therein, so as to perform cleaning work.

[0038] Referring again to Fig. 1, in order to prevent damaging of furniture during the cleaning work, the positioning plate 80 is shorter than the cleaning element 90.

[0039] Each of the hooks 82 has a peak 83, a blocking part 84 and an embracing part 85. As shown in Fig. 9, for each of the hooks 82, the embracing part 85 allows to be pushed inward to lean on an inner wall of one of the holes 75, whereas the blocking part 84 grips an outer periphery thereof. Thus the hooks 82 hold the positioning plate 80 effectively on the holding plates 70.

[0040] To insert the hooks 82 conveniently into the holes 75 of the holding plates 70, for each of the hooks 82 the peak 83 has a front slope 86, a back slope 88 as well as left and right slopes 87.

[0041] To prevent the cleaning element 90 from falling off, the hooks are oriented back to back. Thus tensions exerted during the cleaning work are effectively countered by the blocking part 84 and the embracing part 85 of each of the hooks 82.

[0042] Referring to Figs. 10 - 12, the present invention in second to fourth embodiments has cleaning elements 90A, 90B and 90C, which are a plurality of textile strips, a textile mesh and a plurality of plastics strips, respectively. The cleaning elements 90A, 90B and 90C are fastened to the positioning plate 80 by gluing, screw or binding means, which is conventional art and therefore not explained further.

[0043] For mounting the cleaning head 100, first the hooks 82 on one side are inserted into holes 75, then the hooks 82 on the opposite side are inserted into holes 75. Of course, hooks 82 may be inserted in the order of one on the left and one on the right.

[0044] For dismounting the cleaning head 100, first the hooks 82 on one side are pressed inward and pulled out of holes 75, then the hooks 82 on the opposite side are pressed inward and pulled out of holes 75. Again, hooks 82 may be pulled out in the order of one on the left and one on the right.

[0045] The sweeping and wringing apparatus of the present invention has the following advantages:

1. Manufacturing is easy and inexpensive.
2. Mounting and dismounting of the cleaning head is performed without tools.
3. Due to convenient dismounting of the cleaning head, the handle is taken advantage of effectively.
4. Being made of soft material, the cleaning head is easily squeezed and thus effectively wrung dry.

[0046] While the invention has been described with reference to preferred embodiments thereof, it is to be understood that modifications or variations may be easily made without departing from the spirit of this invention which is defined by the appended claims.

Claims

1. A sweeping and wringing apparatus, comprising:

a handle (10), which is a hollow body, defining a vertical direction;
a moving bar (20), having an upper end (23) that is hingedly connected with said handle (10) at a middle position thereof and a lower end (25) that is placed inside said handle (10) at a lower position thereof;
a transmission rod (30), glidingly mounted within said handle (10) and having an upper end (31) that is hingedly connected with said lower end (25) of said moving bar (20) and a lower end (32) that extends downward beyond said handle (10);
a frame (40), which is a hollow body, having a vertical part (41) with an upper end that is attached to said handle (10) at a lower end thereof and a horizontal part (42) with two far ends that define left and right sides;
a pulling element (60), attached to said lower end (32) of said transmission rod (30);
a cleaning head (100), shaped like an elongated square block;

characterised in that it further comprises:

a pair of hinge plates (50), each hinge plate of said pair of hinge plates (50) being shaped like the letter L, having an upper end that is hingedly connected with one of said far ends of said horizontal part (42) of said frame (40) and having a bent part (52) with a bolt (54);
a pair of holding plates (70), having vertical ribs (71) with inner ends (73) that are hingedly connected with said pulling element (60) and extending symmetrically to the left and right, respectively;

in that the said cleaning head (100) is fastened to said pair of holding plates (70);

and in that, when said moving bar (20) is pulled up in a squeezing movement, said lower end (25) thereof takes said transmission rod (30) upward, which in turn via said pulling element (60) pulls up said pair of holding plates (70) at said inner ends (73) thereof, so that said pair of holding plates

(70) are folded inward, causing said cleaning head (100) to be folded, with continuing said squeezing movement resulting in water contained in said cleaning head (100) to be wrung out, and wherein by reversing said squeezing movement an original state is reinstated.

2. The sweeping and wringing apparatus according to claim 1, **characterised in that** said handle (10) in a middle section has an opening (12), partly accommodating said moving bar (20) during said squeezing movement thereof.

3. The sweeping and wringing apparatus according to claim 1, **characterised in that** said moving bar (20) further comprises an upper rod (21) and a lower rod (22), which is hingedly connected to said upper rod at a middle position thereof.

4. The sweeping and wringing apparatus according to claim 1, **characterised in that** for each holding plate of said pair of holding plates (70), said vertical rib (71) has an outer end into which an elongated hole (74) is cut, passed through by said bolt (54) of one of said pair of hinge plates (50), thus controlling how said pair of holding plates (70) move during said squeezing movement.

5. The sweeping and wringing apparatus according to claim 4, **characterised in that** for each holding plate of said pair of holding plates (70), said elongated hole (74) is oriented in a slanted direction.

6. The sweeping and wringing apparatus according to claim 1, **characterised in that** each holding plate of said pair of holding plates (70) has a horizontal plate (72) with a plurality of holes (75).

7. A cleaning head (100), used in conjunction with a sweeping apparatus, comprising :

a positioning plate (80), roughly shaped like a square and made of soft material; and
a cleaning element (90), shaped like a strip, made of soft material that is able to suck in water and fastened to said positioning plate (80) on a lower side thereof.

8. The cleaning head (100) according to claim 7, **characterised in that** said positioning plate (80) has an upper side carrying a plurality of hooks (82).

9. The cleaning head (100) according to claim 8, **characterised in that** each hook of said plurality of hooks (82) has a peak (83) and a blocking part (84) and an embracing part (85).

10. The cleaning head (100) according to claim 9, **characterised in that** said peak (83) has an inclined front slope (86).

11. The cleaning head (100) according to claim 9, **characterised in that** said peak (83) has inclined left and right slopes (87).

12. The cleaning head (100) according to claim 8, **characterised in that** each hook of said plurality of hooks (82) has an inclined peripheral back slope (88).

13. The cleaning head (100) according to claim 8, **characterised in that** said plurality of hooks (82) is arranged in back-to-back oriented rows.

14. The cleaning head (100) according to claim 7, **characterised in that** said cleaning element (90) is glued to said positioning plate (80).

15. The cleaning head (100) according to claim 7, **characterised in that** said cleaning element (90) is a sponge.

16. The cleaning head (100) according to claim 7, **characterised in that** said cleaning element (90) is a textile strip.

17. The cleaning head (100) according to claim 7, **characterised in that** cleaning element (90) is a textile mesh.

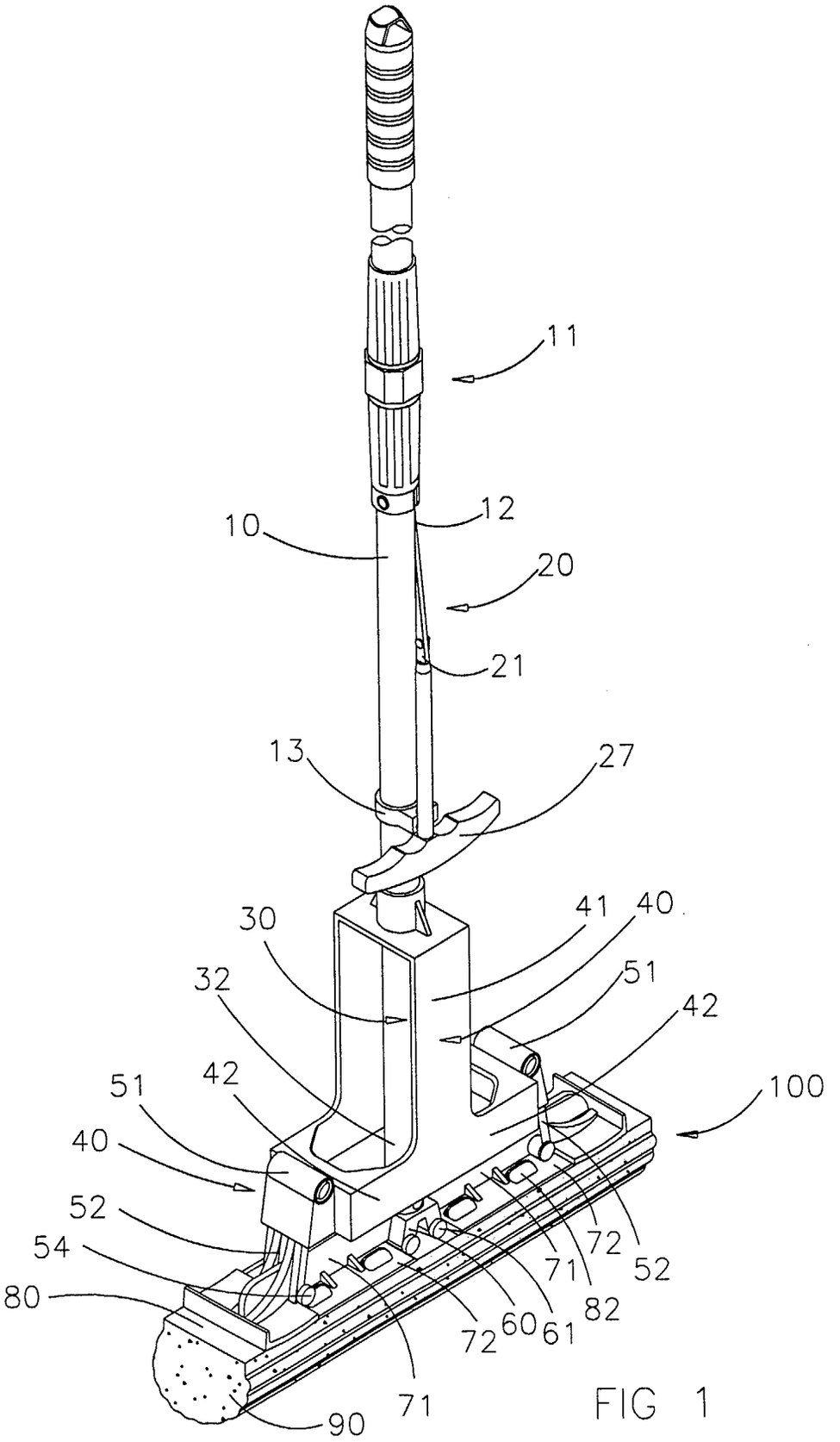
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FIG 1

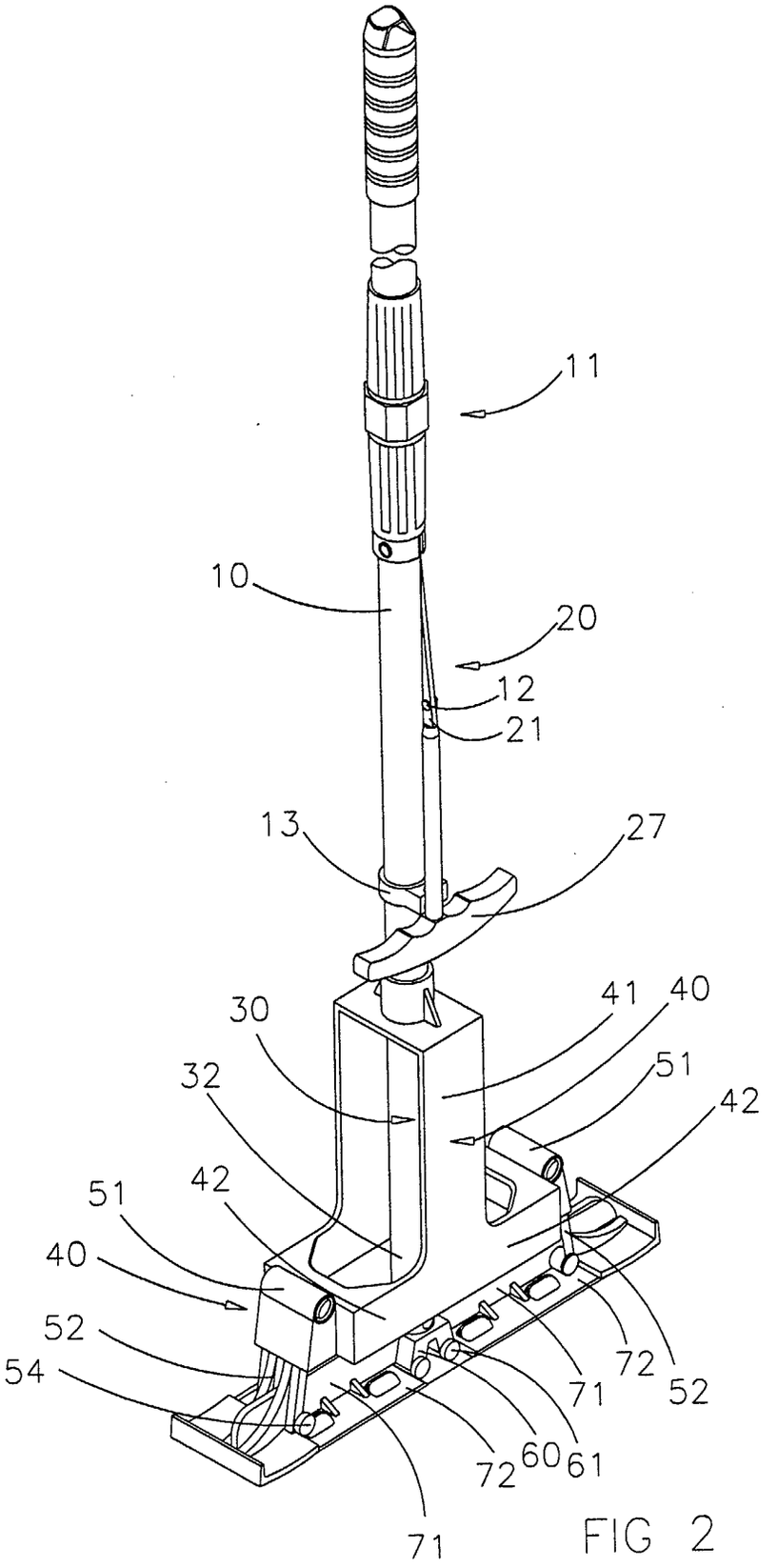
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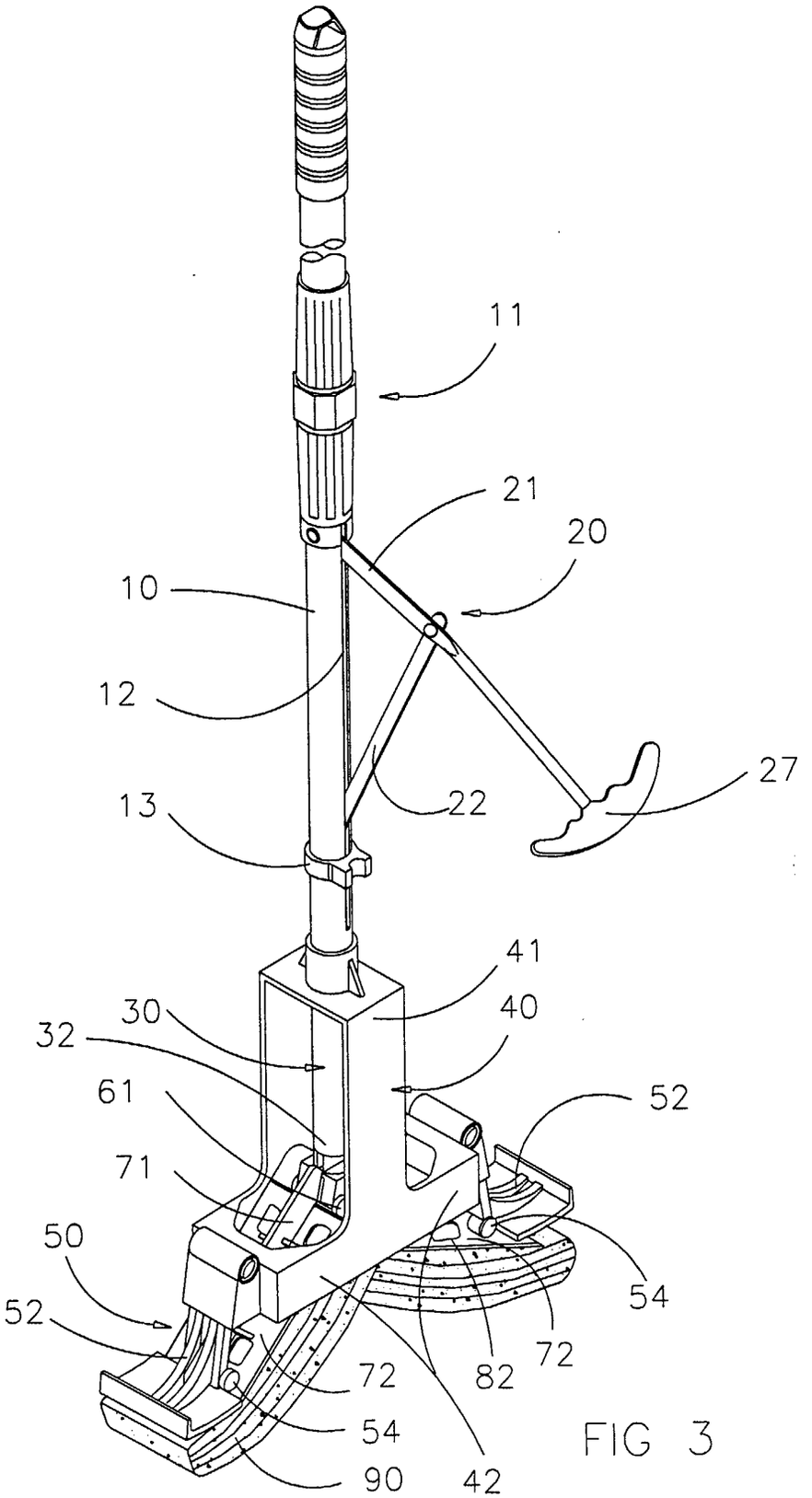
FIG 2



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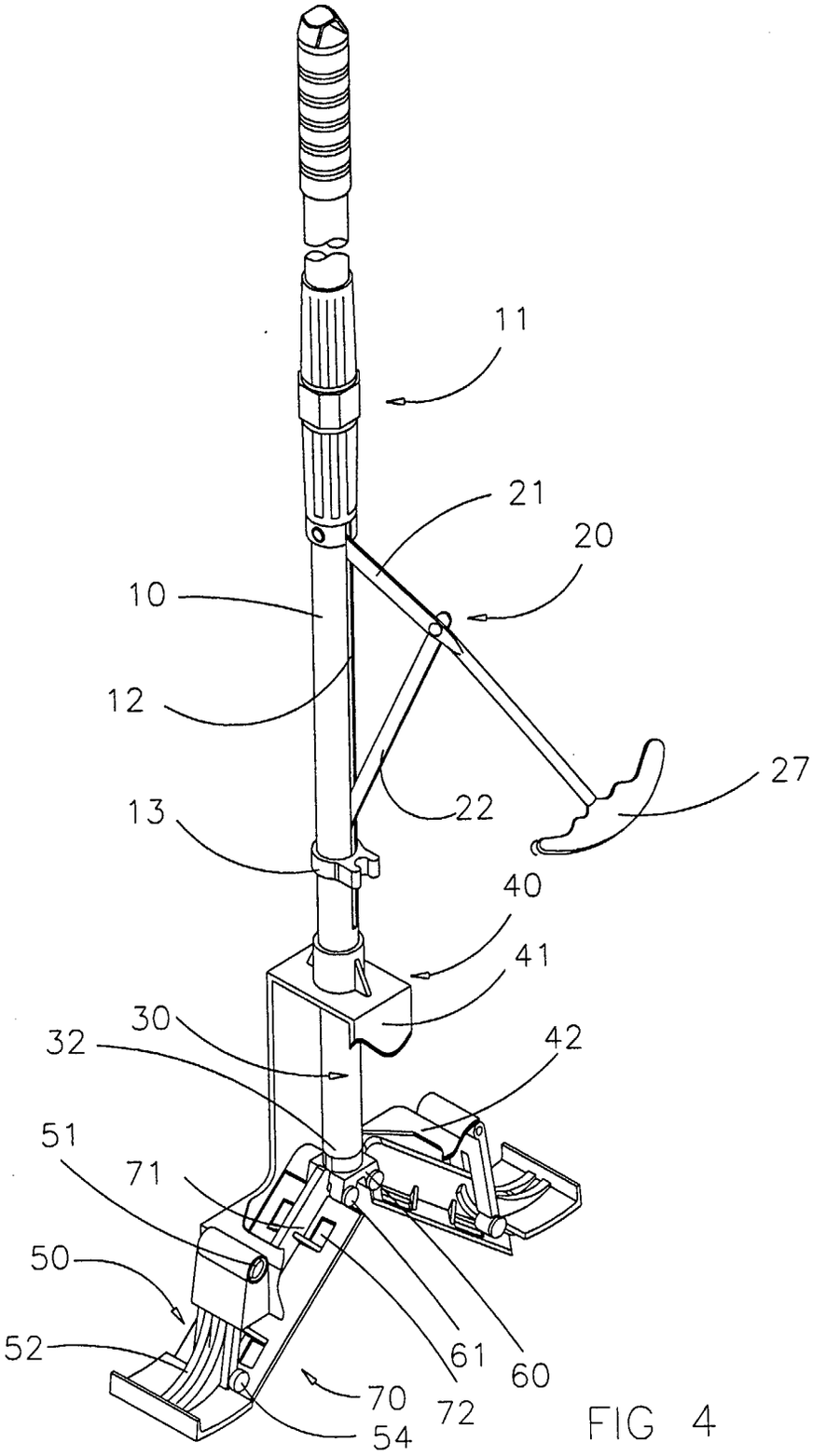

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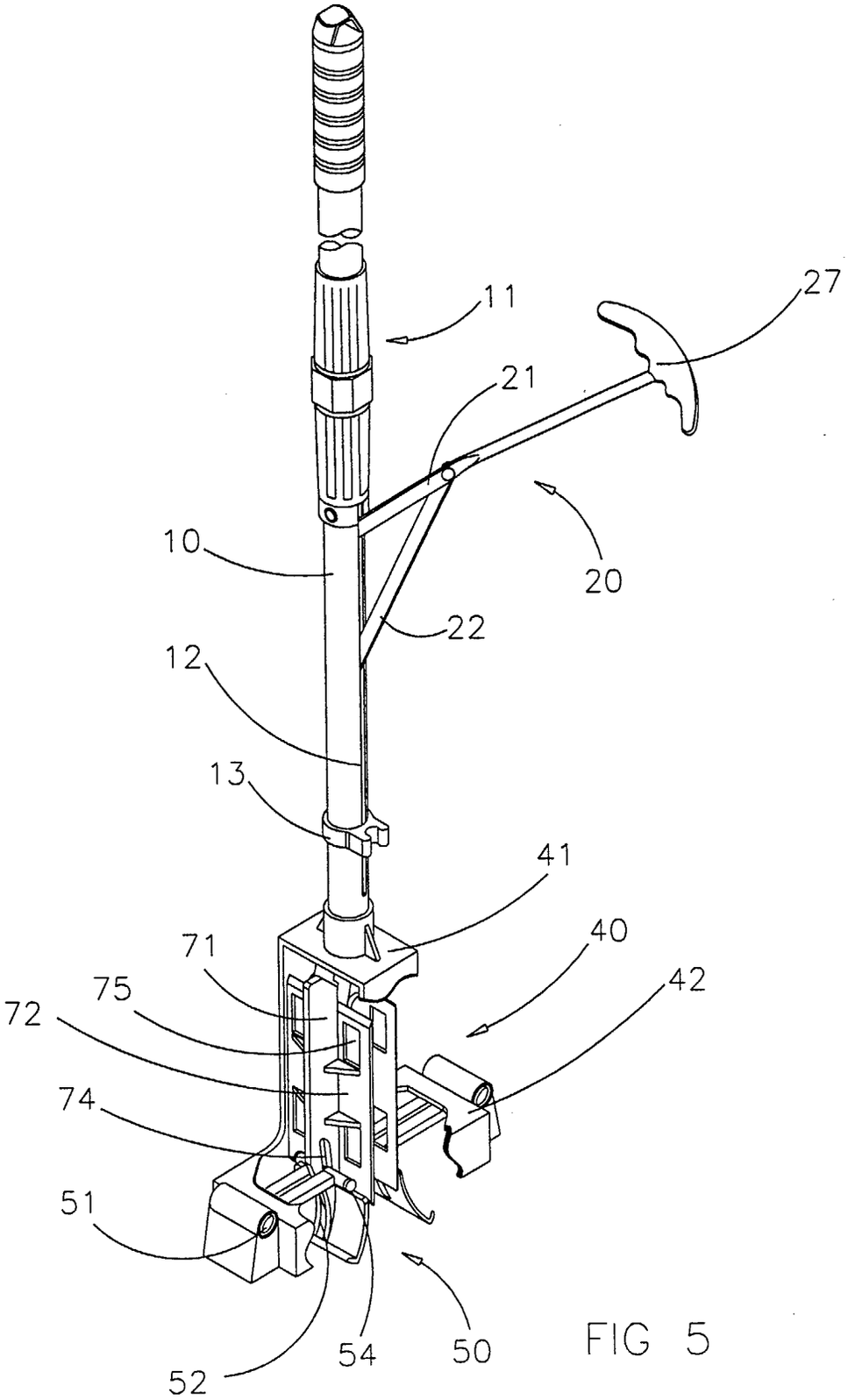


FIG 5

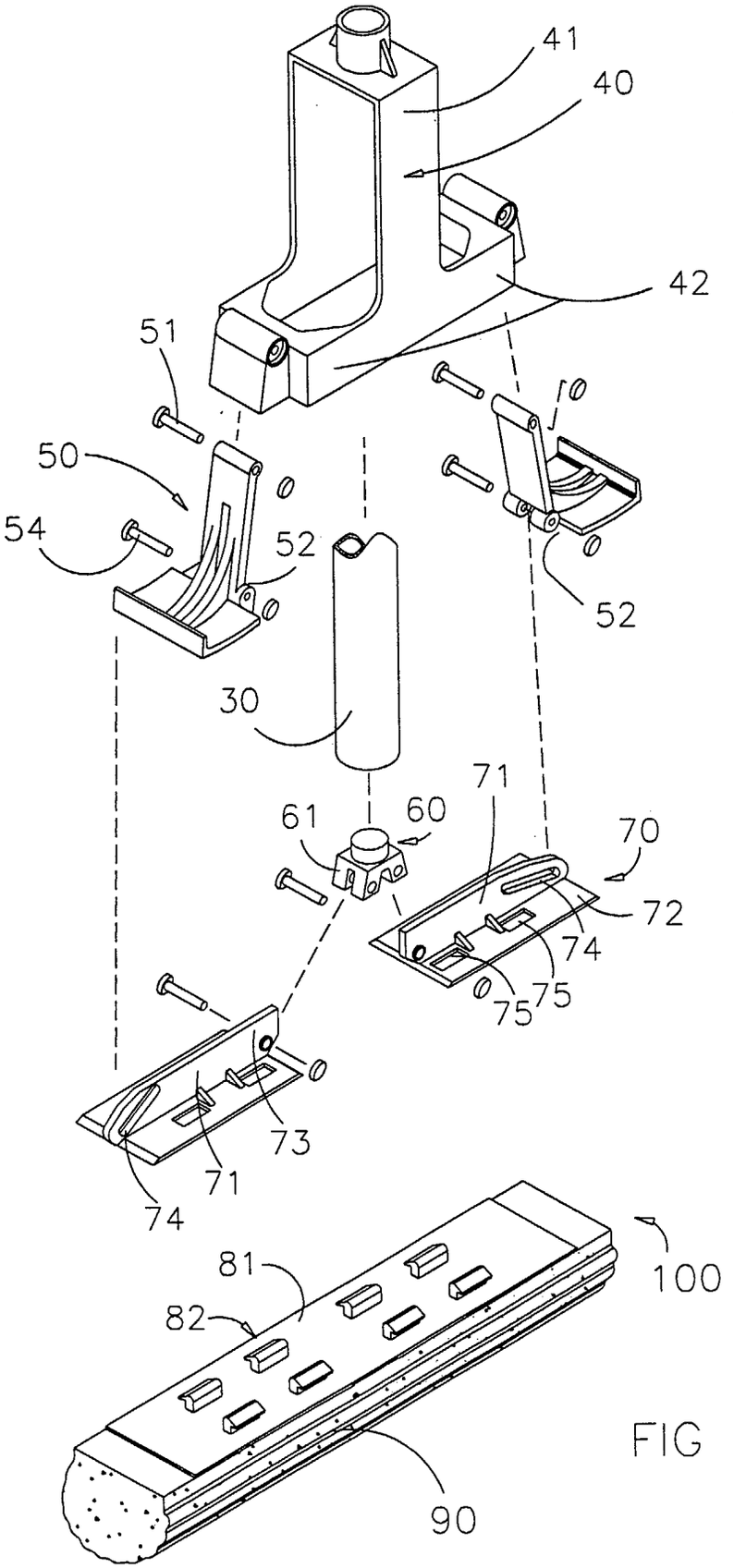


FIG 7

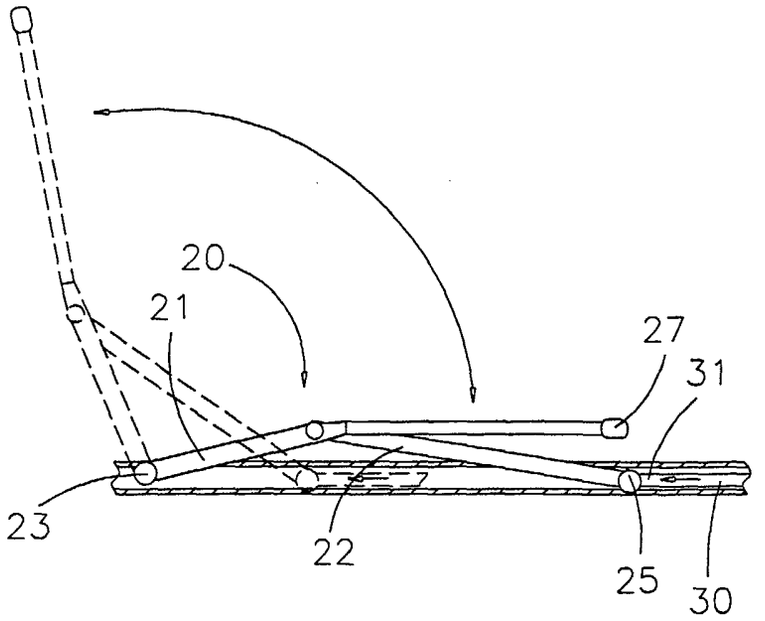


FIG 6

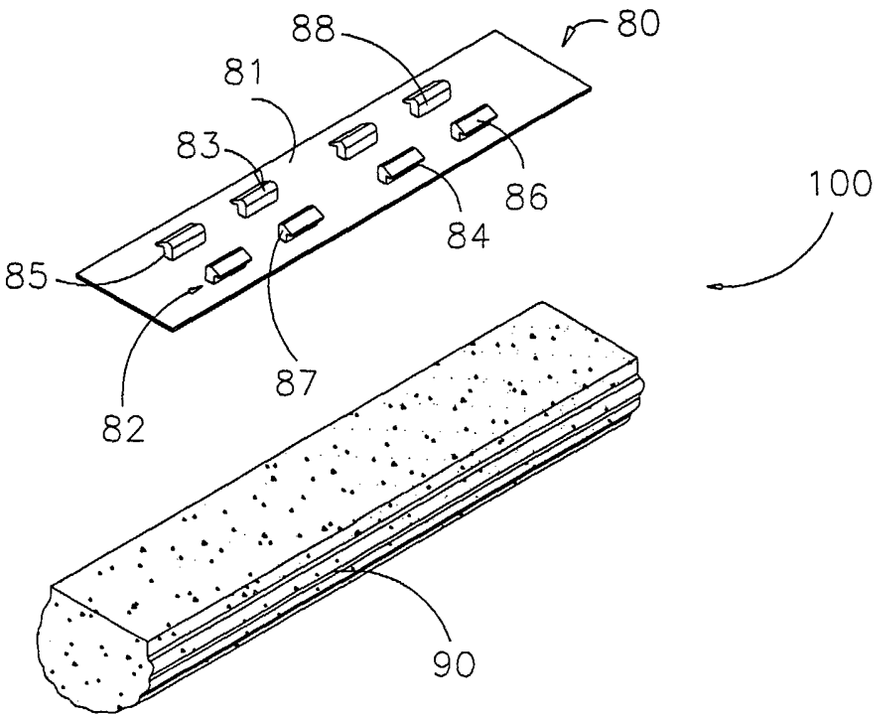


FIG 8

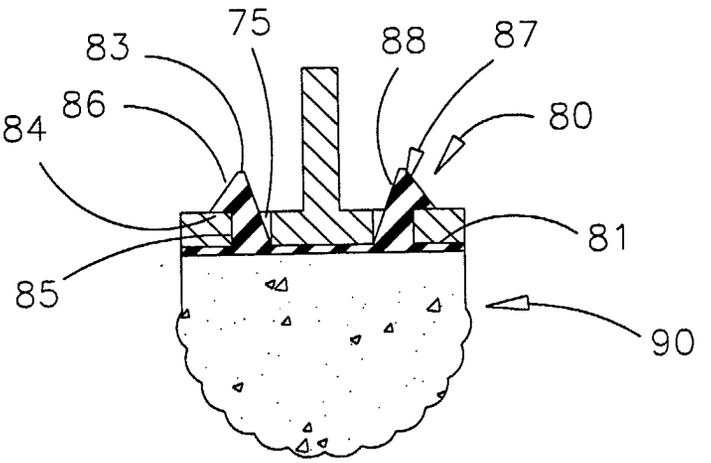


FIG 9

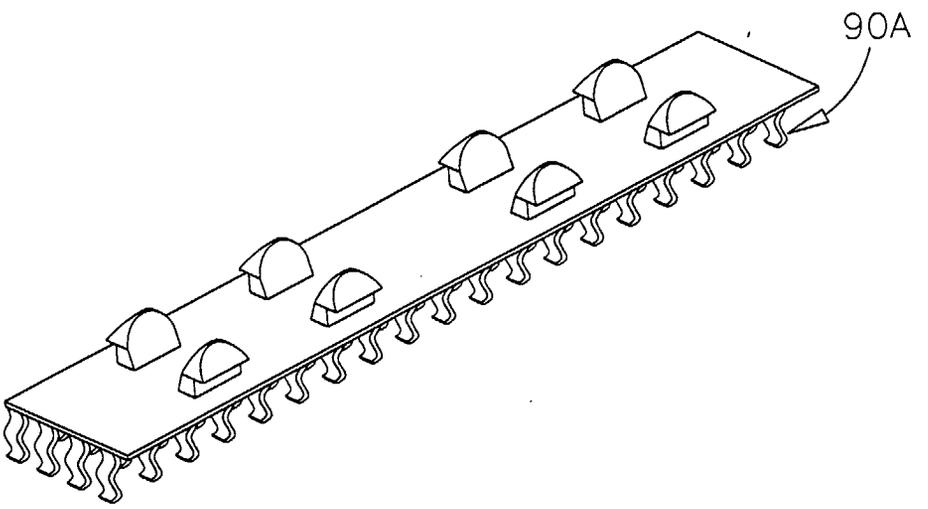


FIG 10

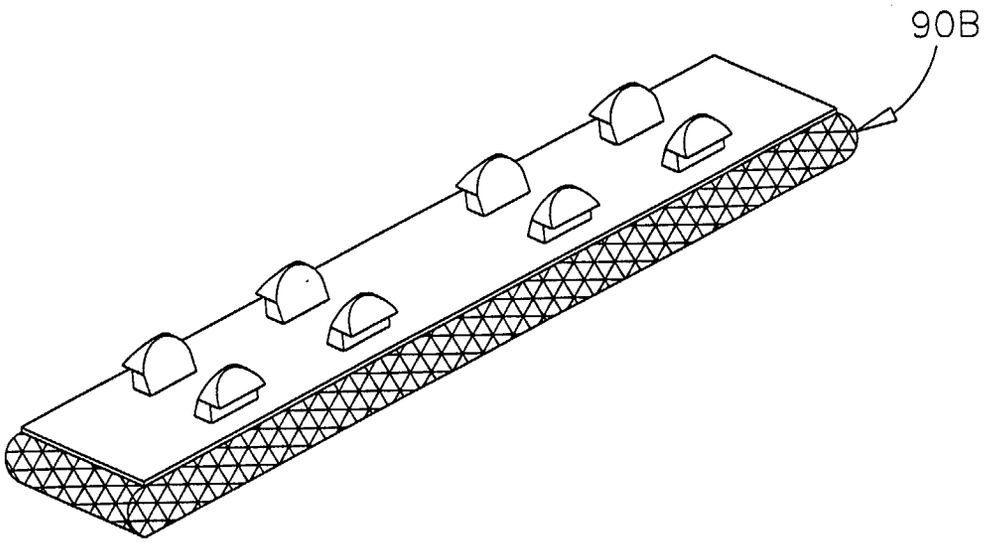


FIG 11

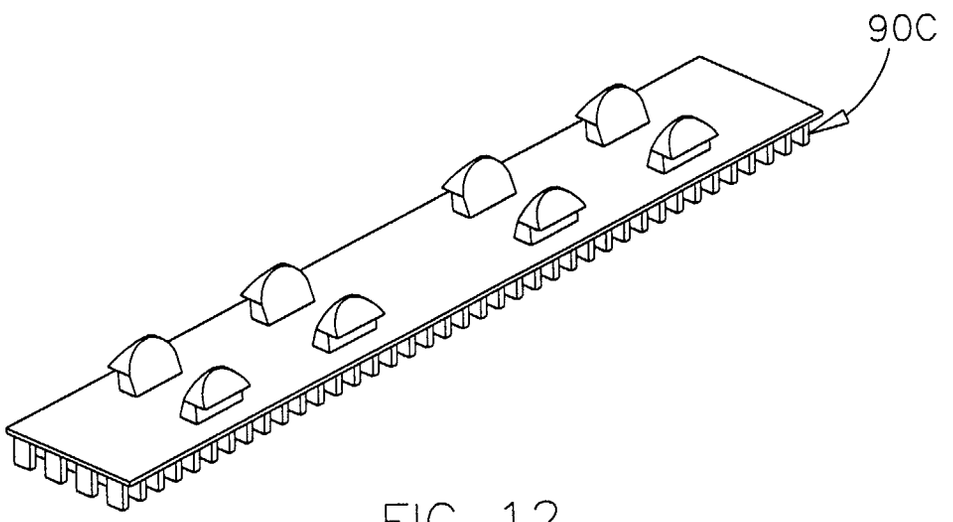
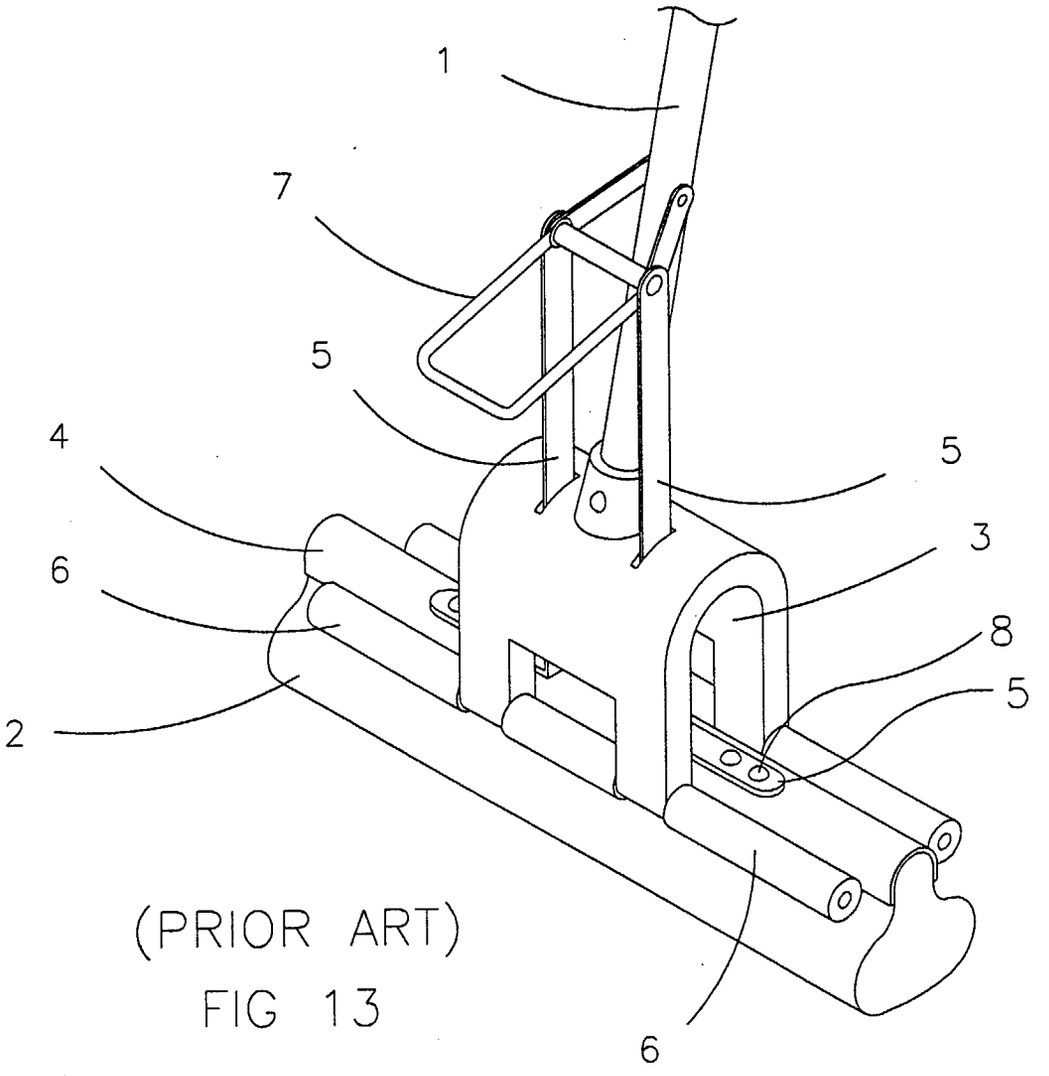


FIG 12



(PRIOR ART)

FIG 13

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 03 44 7100

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)
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A	US 2 877 478 A (MANFRED KLAFTER ET AL) 17 March 1959 (1959-03-17) * the whole document *	7-17	TECHNICAL FIELDS SEARCHED (Int.Cl.7)
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	13 October 2003	Martin Gonzalez, G

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 03 44 7100

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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