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(54) Glue tool and use thereof

(57) There is disclosed a glueing tool (1) for forming glue joints (3) on large items, preferably half-shells (2) for mill wings. In order to achieve uniform width and thickness of the formed glue joint, the nozzle is formed by a chamber (16) which is connected with a tapering outlet (17) ending with an elongate outlet opening (19). The outlet opening (19) defines width and thickness on the formed glue joint.

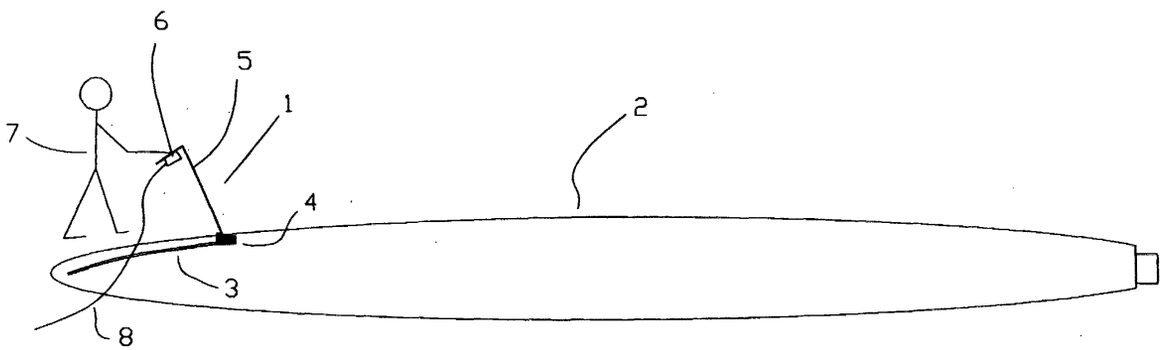

FIG. 1

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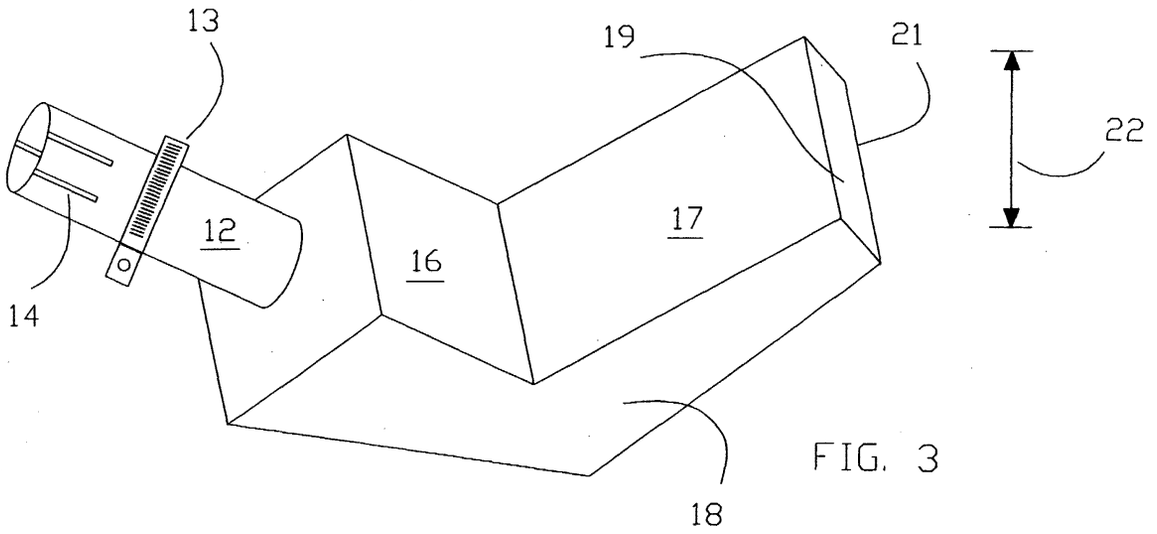

FIG. 3

Description

[0001] The present invention concerns a glueing tool for forming glue joints on large items and comprising a supply hose to a central unit for supplying glue under pressure, a handle with an activating valve, a pipe connected with a nozzle for discharging glue at its end opposite the activating valve.

[0002] By bonding large items in the shape of half-shells for mill wings, presently there is used a similar tool where the nozzle discharging the glue has a tubular outlet. This tubular outlet is particularly designed for supplying and mixing the types of glue used.

[0003] By bonding the items together, often there is used a glue joint with a width larger than the tubular nozzle. This means that the glue is applied in a zigzag pattern. This is very demanding for the person applying the glue joint. It is important to avoid applying too little or too much glue on the items. If too little glue, there is the risk of separation later on, and if too much glue is applied, there is risk of bad hardening and excess glue being squeezed out, and for noise nuisance. Particularly by bonding tips on mill wings is very important that the glue joint is not too thick as the aerodynamic properties of the mill wing is hereby destroyed and may give rise to considerable noise.

[0004] It is the purpose of the present invention to indicate a glueing tool of the kind mentioned in the introduction, which is relatively easy to use, even for an inexperienced user, and which at the same time enables achieving a uniform glue joint.

[0005] According to the present invention, this is achieved with a glueing tool being peculiar in that the nozzle is formed with a chamber which at one side has an inlet stub for connecting with the pipe and which at the other side has a tapered, slot-shaped outlet with a narrow, elongate outlet opening.

[0006] With such a glueing tool, the inlet stub can be formed with slits in the longitudinal direction so that it is fastened on the tubular tools used today. Glue which is thus passed through the inlet stub will penetrate into a chamber. A volume of glue mass is built up in the chamber. In practice, when the glue mass leaves the chamber, it has thus appeared possible that the glue mass follows the whole width of a slot-shaped outlet. By providing the outlet with an outlet opening which is narrow and elongate with a length corresponding to the width of the desired glue joint it is possible in a simple way to apply a glue joint with the desired width. If a narrow outlet opening is used, the thickness of the glue joint may be provided with great accuracy when the user is displacing the nozzle across the item with a speed corresponding to the outflow speed of the glue mass. Such a co-ordination of advancing speed relative to outflow speed is a property which does not require particular technical skill on the part of the user.

[0007] In order to attain a glue joint on the item where there is no risk of air, it is preferred that the wall of the outlet at the side of the outlet aperture intended for contact with the item is tapered and ends with a sharp side edge. Hereby the glue mass is applied directly on the item without risk of air bubbles when it leaves the outlet opening.

[0008] In an advantageous embodiment it is preferred that the chamber and the slot have the same width. Alternatively, it is possible to make chamber an slot with different width and thus possible to make the outlet so that it has increasing width in direction against the outlet opening.

[0009] If the inlet stub is conical and provided with slits extending in longitudinal direction, by means of a clamp or similar it will be possible to fasten it to different pipes in known glueing tools. The nozzle according to the invention is thus advantageous by easily being adapted to existing glueing tools in order to modify these.

[0010] It is preferred to make glueing tools, or at least the nozzle, of steel or stainless steel. Alternatively, it is possible to make it from other materials, for example plastic materials. As cleaning of the nozzle after use will be difficult, it is suitable to make it as a dispensable. Therefore it is suitable that at least the nozzle may relatively easily be made from the remaining part of the tool. In that connection it is noted that glueing tools usually are provided with supply hoses supplying glue under pressure. The glue is usually a two component glue which is only mixed in the glueing tool itself. There will be a risk that glue remnants situated in the nozzle mouth piece may harden when the nozzle is not in use, for example, at the end of a working day.

[0011] If the glueing tool is made to be used several times, it is necessary to be able to clean the nozzle, for example at the end of a working day. Therefore, it will be an advantage if inside the nozzle there is fitted a buffer plate in front of the opening from the inlet stub so that when the nozzle is to be cleaned, solvent/water is flushed into the nozzle where it is hitting the buffer plate and is distributed in the chamber whereby is achieved an effective cleaning of the whole chamber. Besides, the buffer plate provides for the glue mass being evenly distributed out in the chamber so that holes and air in the glue mass is avoided at laying out.

[0012] In order to achieve an even laying out of the glue mass, it is an advantage if in the glueing tool there is built in a variation dampening function for absorbing the different small irregularities and working positions. One form of the glueing tool may be, for example, with a flexible piece of pipe forming transition between inlet stub for nozzle and pipe for handle. The flexible piece of pipe may be welded together with the inlet stub and the pipe to the handle but may alternatively be made so that it is possible by means of clamps or similar to fasten it to the inlet stub and to other pipes in known glueing tools.

[0013] In a particular embodiment, the glueing tool according to the invention is peculiar in that the inlet stub has an internal diameter between 15 and 25 mm, pref-

erably about 20 mm, that the chamber and the outlet have a width between 30 and 200 mm, preferably about 60 mm, and a height at the inlet stub between 35 and 60 mm, preferably about 45 mm, and a height at transition to outlet between 15 and 25 mm, preferably about 20 mm, and that the outlet opening has a height between 5 and 15 mm, preferably about 10 mm. A glueing tool with these dimensions has shown to be particularly useful for modifying a known glueing tool used for bonding half-shells for mill wings.

[0014] The invention will now be explained in more closely with reference to the accompanying schematic drawing, where:

Fig. 1 shows a use of a glueing tool according to the invention,

Fig. 2 is a partial side view of a glueing tool according to the invention,

Fig. 3 is a perspective view for illustrating a nozzle in a glueing tool according to the invention,

Fig. 4 is a side view of a glueing tool of another design,

Fig. 5 is a section of Fig. 4 for illustrating a buffer plate in a glueing tool, and

Fig. 6 is a cross-section A-A in Fig. 5 for illustrating a buffer plate in glueing tool.

[0015] In Fig. 1 is seen a glueing tool 1 for use in bonding a half-shell 2 for a mill wing. There is laid out a glue joint 3 formed by a nozzle 4. The nozzle 4 is provided at one end of a pipe 5 having a handle 6 at the other end, the handle 6 to be gripped by a user 7. The glueing tool is provided with glue mass through one or more supply hoses 8.

[0016] In Fig. 2 is seen the handle 6 with a actuating arm 9 for an activating valve 10 used for opening and closing one or more supply hoses 8. In the shown embodiment, there is provided two supply hoses so that the two component glue mass is mixed when it is conducted through tubes 5 from the activating valve 10. At the the outlet end 11 of the tube, the nozzle 4 may be attached. As more clearly appearing from Fig. 3, the nozzle has an inlet stub 12 which is clamped around the tube 5 by means of a clamp 13. The stub may be adapted to variations in the tube diameter as slits 14 extending in the longitudinal direction of the stub are provided. The stub 12 is passing through a wall 15 into a chamber 16 which is communicating with a slot-shaped outlet 17. In the embodiment shown, the chamber and the slot have the same width as the side walls 18 are provided plane. The outlet ends in a narrow elongate outlet opening 19. At the underside which is intended for contacting an item, there is provided a bevelling (see Fig. 2) so that a sharp edge 21 occurs at the downward facing side of the outlet opening 19. When glueing tool 1 is used, it has appeared that the chamber 16 is filled with glue mass being pressed out through the elongate outlet opening 19 with uniform thickness and speed over the whole width of the slot. Thus it is possible to form a very uniform glue joint 3 having a width corresponding to the width 22 of the slot-shaped outlet opening 19.

[0017] In Fig. 4 is seen a glueing tool with another design than shown in the previous two Figures. The glueing tool is made with a flexible piece of pipe 23 which at one end is fastened to the inlet stub 12 and which at the other end is fastened to a tube piece 5.

[0018] In Figs. 5 and 6 is seen a glueing tool shown in Fig. 4. The glueing tool is made with a buffer plate 24 mounted inside the chamber 16 on wall 15 and in front of the opening from inlet stub 12.

[0019] A glueing tool according to the invention may be designed in other ways than shown on the drawing. Thus it is possible to make the outlet 17 with increasing width in direction against the outlet opening 19. Alternatively, it is possible to design the product with different width between the chamber 16 and the outlet 17. It is also possible to design the chamber with other shapes. For example, the chamber 16 may be approximately cylindrical with inlet stub and outlet situated on the cylinder surface.

Claims

1. A glueing tool for forming glue joints on large items and comprising a supply hose to a central unit for supplying glue under pressure, a handle with an activating valve, a pipe connected with a nozzle for discharging glue at its end opposite the activating valve, **characterised in that** the nozzle is formed with a chamber which at one side has an inlet stub for connecting with the pipe and which at the other side has a tapered, slot-shaped outlet with a narrow, elongate outlet opening.

2. A glueing tool according to claim 1, **characterised in that** the wall of the outlet at the side of the outlet aperture intended for contact with the item is tapered and ends with a sharp side edge.

3. A glueing tool according to claim 2 or 3, **characterised in that** the chamber and the slot have the same width.

4. A glueing tool according to any preceding claim, **characterised in that** the inlet stub has an internal diameter between 15 and 25 mm, preferably about 20 mm, that the chamber and the outlet have a width between 30 and 200 mm, preferably about 60 mm, and a height at the inlet stub between 35 and 60 mm, preferably about 45 mm, and a height at transition to outlet between 15 and 25 mm, preferably about 20 mm, and that the outlet opening has a height between 5 and 15 mm, preferably about 10 mm.

5. A glueing tool according to any preceding claim, **characterised in that** the inlet stub is conical and is provided with slits extending in the longitudinal direction of the stub.

6. A glueing tool according to any preceding claim, **characterised in that** it is made of stainless steel, steel or plastic.

7. A glueing tool according to any preceding claim, **characterised in that** the outlet has increasing width in direction toward the outlet opening.

8. A glueing tool according to any preceding claim, **characterised in that** inside the chamber is fitted a buffer plate in front of the opening from the inlet stub.

9. A glueing tool according to any preceding claim, **characterised in that** between the inlet stub and pipe for the activating valve there is fitted a flexible piece of pipe.

10. Use of a glueing tool according to any preceding claim for glueing together half-shells for mill wings.

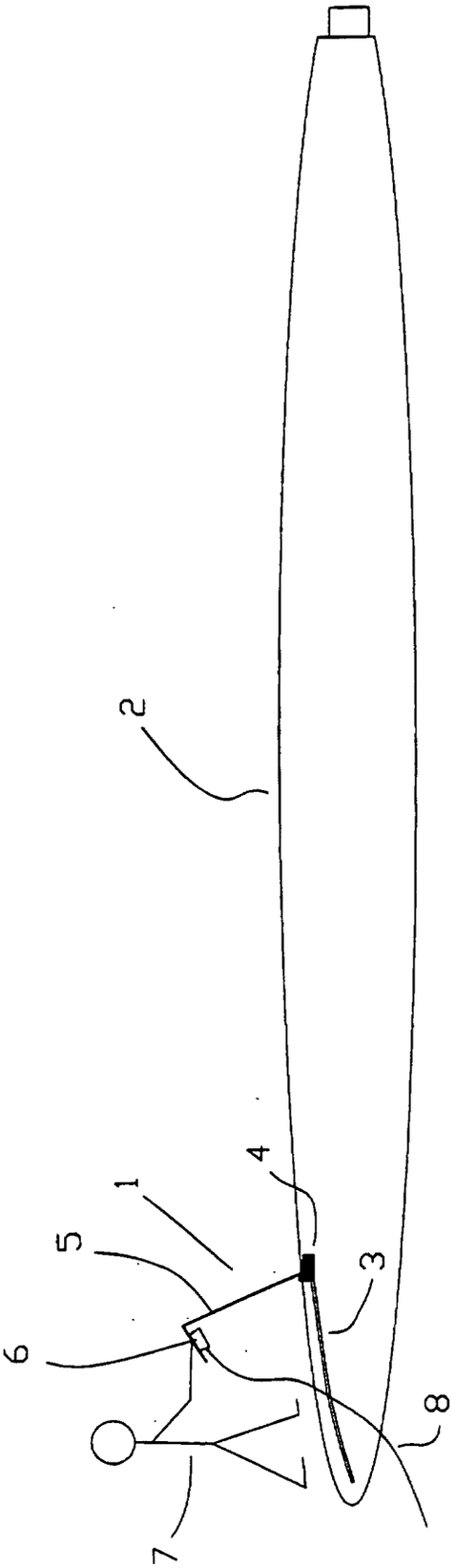

FIG. 1

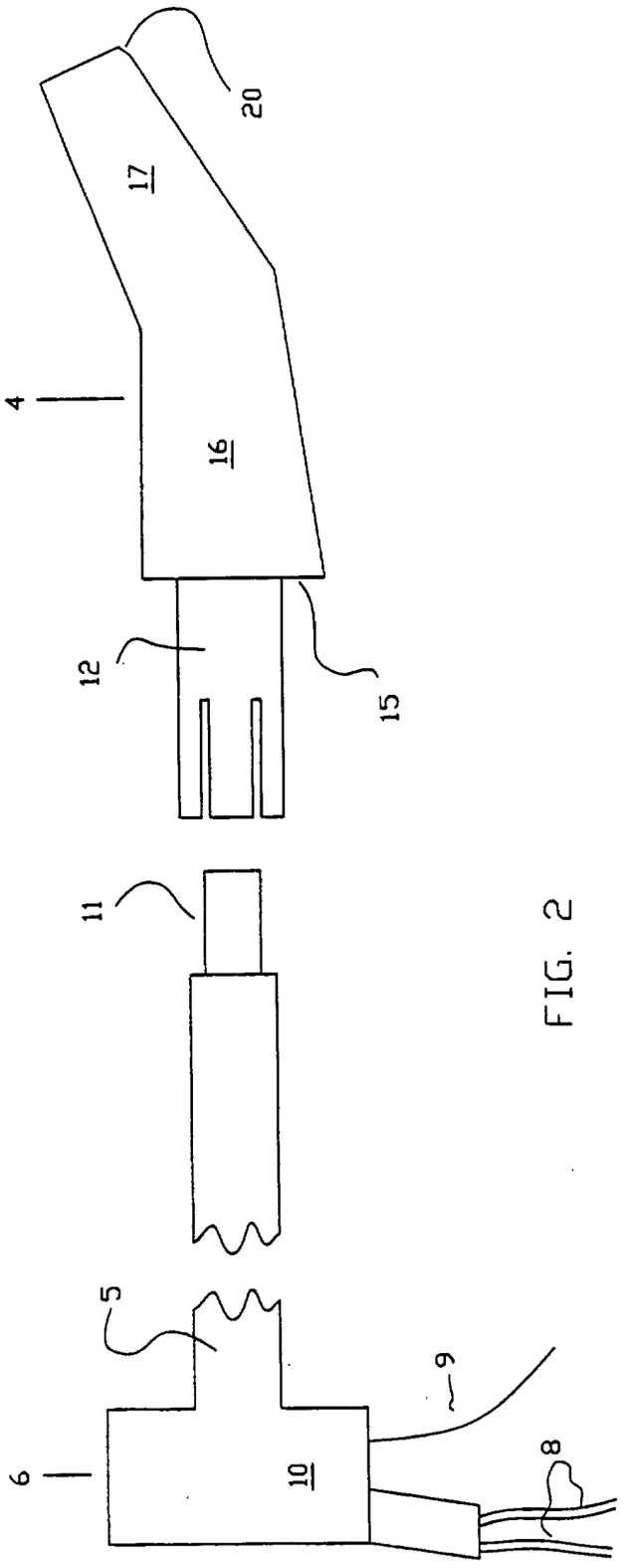

FIG. 2

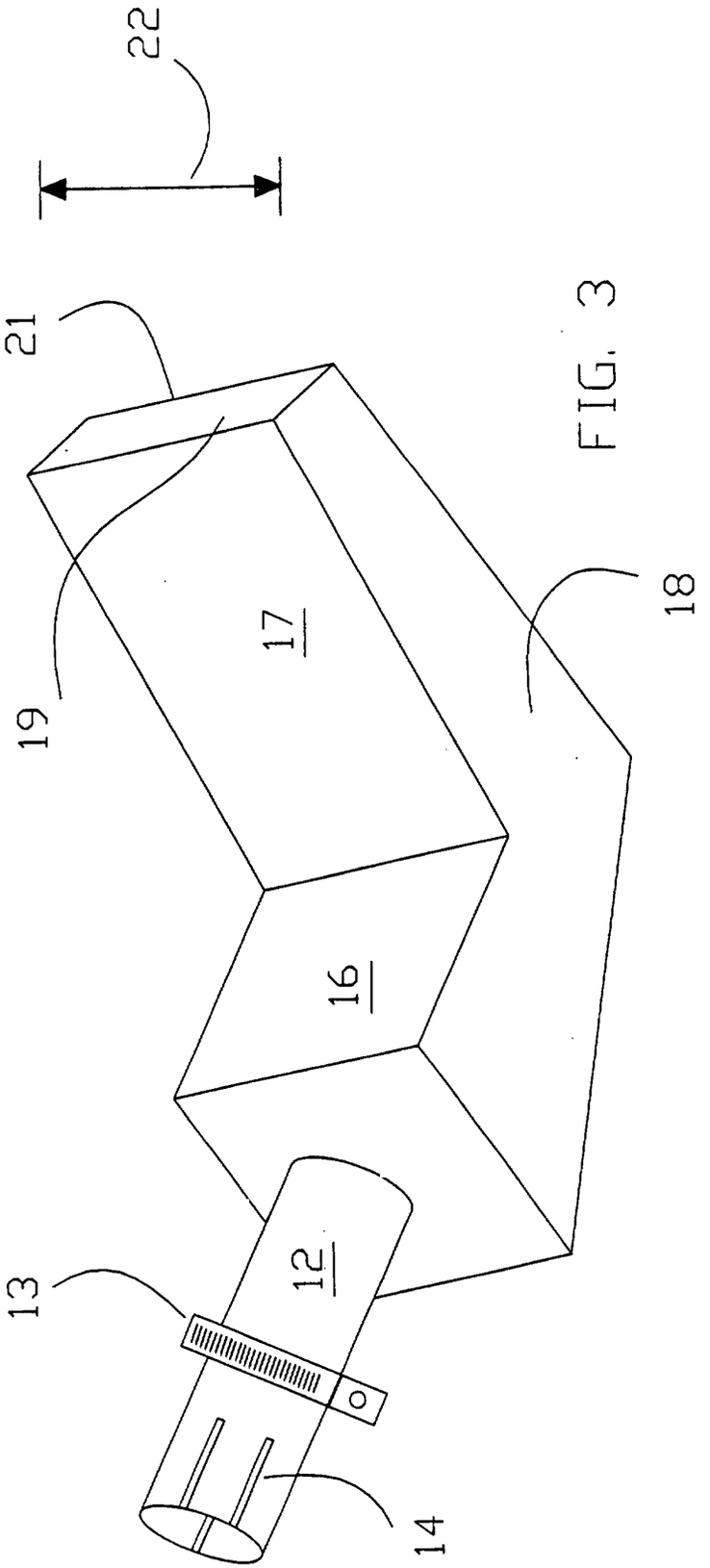

FIG. 3

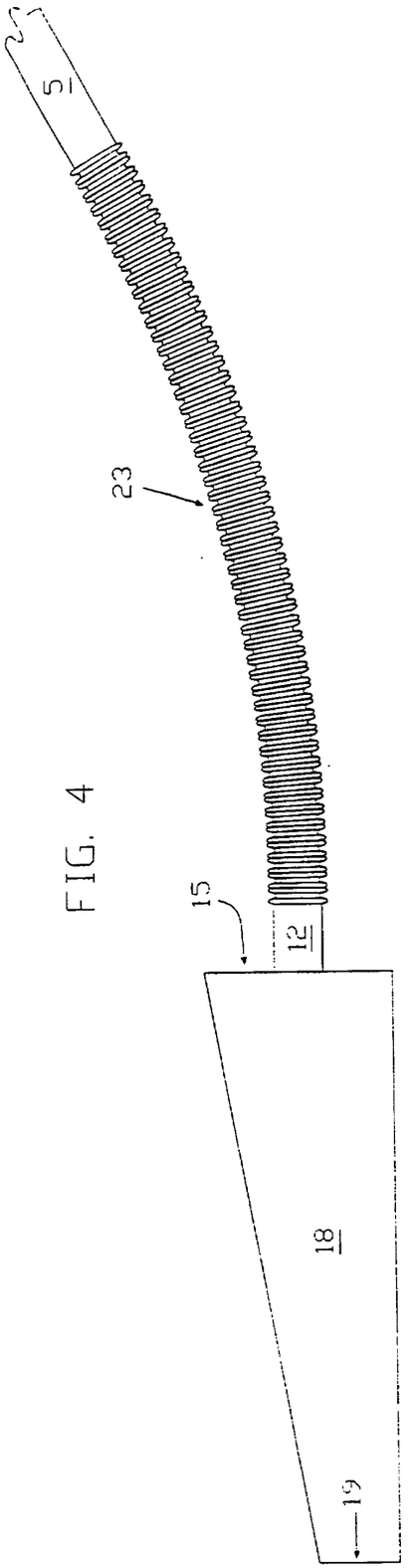

FIG. 4

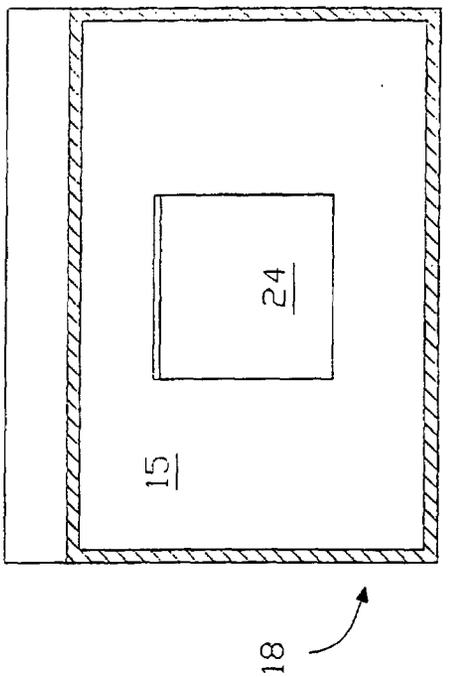

FIG. 6

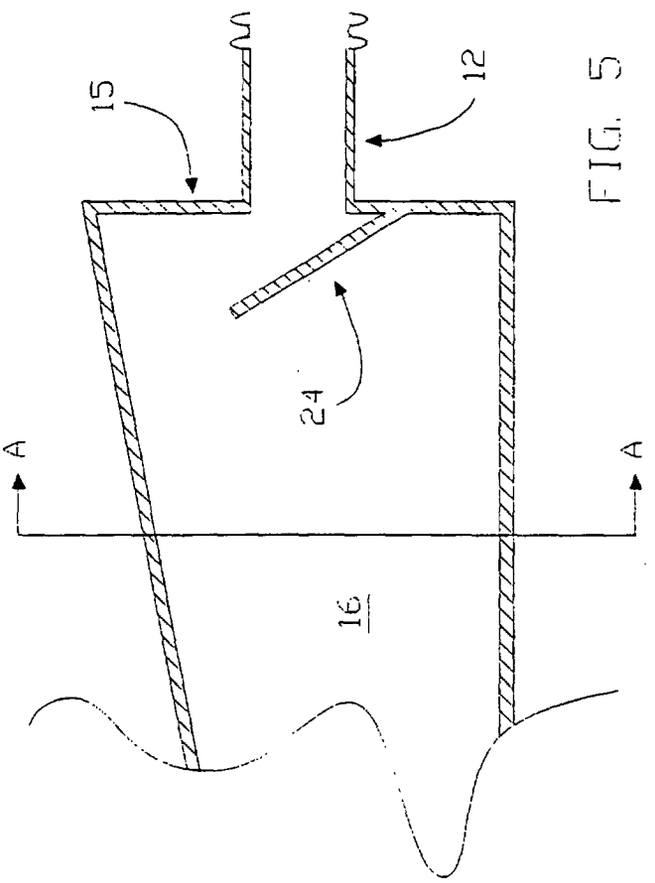

FIG. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 01 11 2545

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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
THE HAGUE	7 September 2001	Barré, V

CATEGORY OF CITED DOCUMENTS

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