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(71) Applicant (for all designated States except US): **AMATORI S.R.L.** [IT/IT]; Zona Industriale, Prato Sardo, Lotto no. 30, I-08100 Nuoro (IT).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **AMATORI, Enzo** [IT/IT]; Via La Malfa, 48, I-08100 Nuoro (IT). **MORO, Bruno** [IT/IT]; Via Marco Polo, I-08100 Nuoro (IT).

PELUFFO, Livio [IT/IT]; Via Cucca, 18, I-08100 Nuoro (IT).

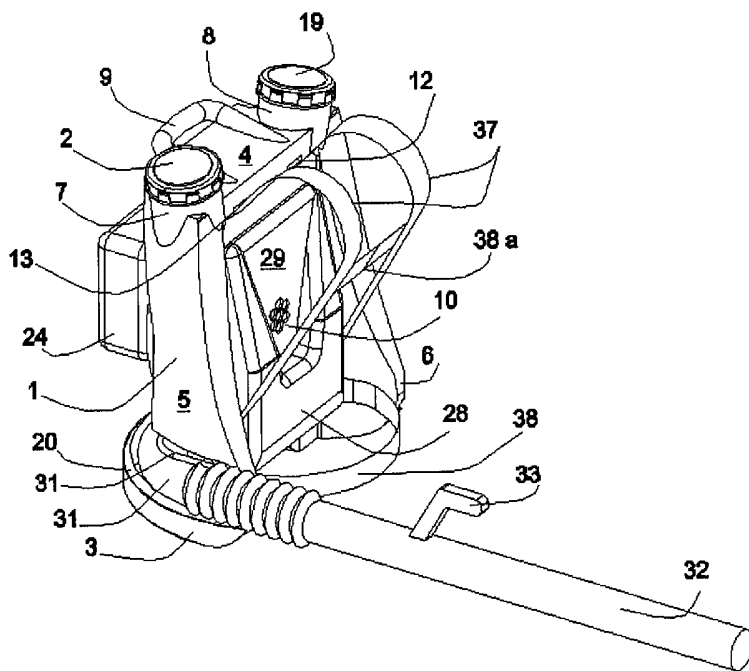
(74) Agent: **PELLEGRI, Alberto**; c/o Società Italiana Brevetti S.p.A., Piazza Repubblica, 5, I-21100 Varese (IT).

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(54) Title: "KNAPSACK BLOWER-SPRAYER"



(57) Abstract: A knapsack blower-sprayer has its load bearing structure constituted by an hollow body (1) of molded plastic material that extends for the whole height of the machine, has a broadened base portion (3) compared to the narrower top portion (4), forming a quarter-moon shaped rest basement, rearwise and frontwise extended flanks (5, 6) in proximity of the broadened base (3) to which they join partially wrapping the flanks of the bearer, and has a concave or recessed area on the outer surface of the back wall of the hollow body (1), at the centre of which is defined a ventilation tube (11) or nest of tubes passing through the molded body (1), open on the outer surfaces of the front and back walls of the hollow body. The hollow body has two liquid filling openings at the rims of respective tubular appendices (7, 8) that extend from the two sides of the top (4) of the molded hollow body, closed by screw caps (2, 19).

Through a first filling opening, access is provided to a fuel tank (18) defined within the inner space of the hollow body (1) containing the fuel that is delivered through a hose to the internal combustion engine (24) of the centrifugal fan (23). The second liquid filling opening accesses the internal volume of the hollow body (1) that is fillable with a liquid to be sprayed that substantially surrounds the outer surface of the fuel tank (18) defined or installed inside the hollow body shielding it from external heat. T



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“KNAPSACK BLOWER-SPRAYER”

The present invention relates to knapsack blower-sprayers and in particular to a knapsack sprayer usable even for fighting bush fires.

Knapsack blower-sprayers are portable machines of general use in farming,
5 breeding, gardening, cleaning, disinfecting, for the maintenance of urban and extra urban roads. Many models and brands are commercially available.

A most familiar use of these knapsack machines is that of simple motor driven air blower for gathering fallen leaves, cleaning curbs and drainages.

Knapsack air blowers equipped with a separate tank fillable with a liquid to be
10 sprayed (by injecting it through a Venturi nozzle device fitted inside the delivery tube near the outlet of the blown air stream) are widely used for spraying cultivated plants, soils, animal breeding structures, parks and gardens with anticryptogammics, insecticides, disinfecting solutions or the like.

Known knapsack blower-sprayers have the tank of the liquid to be dispersed in
15 minute droplets (atomized) form, installed above a centrifugal fan and internal-combustion engine assembly, practically behind the neck-scoll of the operator, while the relatively smaller fuel tank of the internal-combustion engine is generally installed above or in many cases below the engine-centrifugal fan group.

The above-noted functional components of the machine are commonly fastened to
20 and sustained by a frame that is typically made of metal tubes or rod sections of aluminum or of a plastic material, provided with suspenders and belts and of a soft back-rest padding.

The distribution of weights in these known knapsack machines is far from helping in reducing the fatigue of the operator. Primarily this is due to the fact that the
25 spatial arrangement of the functional parts determines a center of gravity that is rather high and also located at a considerable distance from the back of the

operator, considering that at full load the weight is in a large measure concentrated in the tank containing the liquid to be sprayed. Moreover, the lapping of the liquid inside the tank, the gravity point of which is higher than the central gravity point of the whole machine, causes significant torques and joltings
5 that unpleasantly tension the slinging aggravating the fatigue of the operator when moving around, especially on unlevelled or steep terrain.

Another drawback of the known machines is due to the fact that the relatively elevated position of the tank of the liquid to be sprayed gravely limits the freedom of rotation and retroflexion of the head of the operator, forcing him to maintain
10 his head in a somewhat limited postural state. This represents an important further cause of fatigue especially of the neck muscles besides impeding the fullest liberty of movement of the head in favoring and counterbalancing up steps or short jumps of the operator in moving over the terrain.

If these inconveniences are to some extent tolerable and are apparently tolerated
15 though with aggravation of the fatigue, when using the machine on cultivated terrains relatively flat and/or levelled, they become extremely severe in case of using the knapsack machine on rough terrain and often relatively steep, as typically encountered by bushfire fighters in spraying water or fire-retardant liquid with said knapsack blower-sprayers. Moreover, the fuel tank of known
20 knapsack blower-sprayers is exposed to sunlight and inevitably to the thermal radiation from nearby flames or smoldering live charcoal when using the machine for firefighting, an aspect that increases evaporation of the fuel and may even represent a risk for the fire fighters.

The same organization of parts and distribution of weights in known knapsack
25 blower-sprayers makes them unstable when placed in an erect position over ground, requiring extended feet or rest bars of the frame to provide a rest base sufficiently ample to stably sustain the machine in upright position even with the tank of the liquid to be dispersed completely full.

Vis-à-vis this state of the art, the applicants have found an architecture of a

knapsack blower-sprayer that effectively overcomes the inconveniences and drawbacks of the known machines, providing a novel knapsack blower-sprayer that can be carried and used with less discomfort and efficiently used in enhanced safety conditions even by bushfire fighters, called necessarily to move over rough
5 and/or steep terrain, providing for an augmented mobility while significantly reducing fatigue.

Basically, the knapsack blower-sprayer of the present invention has its load bearing structure constituted by an hollow body of molded plastic material that extends for the whole height of the machine, has a broadened base portion
10 compared to the narrower top portion, forming a quarter-moon shaped rest basement, rearwise and frontwise extended flanks in proximity of the broadened base to which they join partially wrapping the flanks of the bearer, and has a concave or recessed area on the outer surface of the back wall of the hollow body, at the centre of which is defined a ventilation tube or nest of tubes passing through
15 the molded body, open on the outer surfaces of the front and back walls of the hollow body.

The hollow body has two liquid filling openings at the rims of respective tubular appendices that extend from the two sides of the top of the molded hollow body, closed by screw caps. Through a first filling opening access is provided to a fuel
20 tank defined within the inner space of the hollow body for containing the fuel that is delivered through a hose to the internal-combustion engine of the centrifugal fan. Most preferably, the fuel tank is defined internally of the hollow body during its molding, for example by creating an internal wall or partition of the internal volume of the hollow body. Alternatively, the fuel tank may be performed
25 separately and introduced inside the hollow body, sealing or welding an end flange or rim of the preformed fuel tank around the rim of the respective tubular appendix of the top of the molded hollow body.

The second liquid filling opening accesses the internal volume of the hollow body that is fillable with a liquid to be sprayed that substantially surrounds the outer

surface of the fuel tank defined or installed inside the hollow body. In this way, the fuel tank is effectively shielded from external heat and is sensibly maintained cool by the liquid to be sprayed that is repeatedly loaded inside the hollow body.

5 The commonly pre-assembled group composed of the centrifugal fan and its internal-combustion engine is fixed onto common antivibration supports over said concave or recessed area of the external surface of the back wall of the hollow molded body and at a certain distance therefrom to allow for an unhindered intake of air and the axial air inlet of the centrifugal fan is close to and aligned with the ventilation through-passing tube or nest of tubes to promote air suction through
10 the ventilation tube or tubes across the hollow body.

By virtue of the dual structural load bearing function and liquid holding capacity of the hollow molded body of the machine, a weight distribution is made possible such to determine a center gravity of the whole machine at a significantly low level, approximately coinciding with the geometrical center of the machine when
15 fully loaded with the liquids, and which in turn coincides approximately with the axis of rotation of the engine-centrifugal fan assembly and therefore at a height corresponding to about half the chest of the operator and relatively close to it.

The fuel tank, defined in the interior of the hollow molded body is practically immersed in the liquid to be sprayed with which the interior is eventually filled.
20 This peculiar organization of the fuel tank, besides contributing to a concentration of weights as close as possible to the center of gravity of the whole machine, provides, as already said, a significant protection and keeps relatively cool the fuel of the internal-combustion engine of the centrifugal fan thus reducing significantly vapor leakages, an aspect even more significative in case of use of
25 the knapsack blower-sprayer for fighting bushfires and especially during transportation of the machine inside a vehicle.

The centrality and the concentration of the weights of the liquids (fuel and liquid to be sprayed) near the center of gravity and an effectively hindered lapping of the liquids, especially of the water (or other liquid to be sprayed) inside the hollow

molded body, by virtue of the obstructive presence of the fuel tank, of the ventilation tube or nest of tubes and of other impediments that will be identified later in this description, minimize jolting and twisting stresses transmitted to the suspenders, waist and chest belts of the slinging when moving around.

- 5 The fullest freedom of movement left to the head of the operator, as far as to permit a full retroflexion of the head without any impediment from the machine carried on the back of the operator, permits a more efficient and less fatiguing movement of the operator, especially in stepping over obstacles, moulds, crevices and steps of the terrain.
- 10 Moreover, the suction of air by the centrifugal fan through a ventilation tube or tubes passing through the hollow molded body from an open at the top gap space defined by a special shape of the back-rest padding, between the front wall of the molded body and the back of the operator, prevents excessive sweating and provides for a greater comfort of the bearer.
- 15 The absence of metallic load bearing structures and rest feet, and a reduced number of metallic hardware components permit an outstanding constructional simplification of the knapsack blower-sprayer of this invention, that is enhanced by the use of resins of low weight/strength ratio for molding the hollow body.

20 The different aspects and advantages of the invention will become even more evident through the following description of a preferred embodiment.

Figures 1 and 2 are three-dimensional views of the knapsack blower-sprayer of the present invention.

Figure 3 is a three-dimensional view of the back of the knapsack blower-sprayer.

25 **Figure 4** is a cross sectional view of the hollow molded body and of the fuel tank realized therein, according to an embodiment.

Figures 5, 6 and 7 are a back, front and side views of the knapsack blower-sprayer.

Figure 8 shows an accessorial pedestal fixable over a load platform of a vehicle, to facilitate transportation of the knapsack machine, safely secured in an upright

position.

Figure 9 shows the knapsack blower-sprayer anchored on the pedestal.

Figures 10, 11, 12, 13, 14 and 15 are photographic illustrations of several peculiar characteristics of ease and comfort of use of the knapsack blower-sprayer of the
5 present invention.

With reference to the figures, the knapsack blower-sprayer of this invention has a load bearing structure constituted by a hollow molded body 1 of a moldable resin of good mechanical strength, for example a polypropylene, a polyethylene, a polycarbonate and equivalents, formed in a mold, for example by a so-called
10 “rotational” technique, the hollow interior space of which can be filled with a liquid to be sprayed in droplets (atomized) carried by a directable jet stream of blown air through a first aperture closed by a screw cap 2.

Thus, the hollow body 1, besides constituting the load bearing structure of the machine, constitutes also the container of the transported liquid.

15 The hollow body 1 extends for the full height of the machine from a base or bottom portion 3 that is broader than the top portion 4. The base portion 3 of the hollow body broadens to constitute a planar rest basement having a “quarter moon” shape.

Accordingly, the two flanks 5 and 6 of the hollow body 1 widen front wise and
20 back wise upon approaching the point of joining with the broadened base portion 3. As may be better appreciated by looking at the figures, the two flanks 5 and 6 widen progressively in approaching the point of joining with the base portion, such to assume a gradually more and more “wrapping” conformation around the waist of the bearer.

25 The waist wrapping shape of the lower part of the two flanks 5 and 6 of the hollow body 1, coupled to the highly preferred presence of a second chest belt 38 effectively opposes oscillation of the knapsack blower-sprayer when the bearer moves around.

As may be better observed on the sectional view of Figure 3, the hollow body 1 has at the two sides of its top portion 4 two tubular appendices 7 and 8, preferably divergently slanted sideway, defining respective openings with sideway slanted rims, and a central handgrip 9 between the two tubular appendices 7 and 8, for
5 comfortably lift up and carry the blower-sprayer with one hand.

Moreover, the mold defines a plurality of tubes and/or conduits that pass through the hollow body from back to front and eventually also simply stiffening posts or spacers.

In the embodiment shown, a single through passing ventilation tube 11 is defined
10 approximately at a geometrical center of the hollow body 1. Alternatively, several through passing tubes, grouped to constitute a nest of tubes may be formed instead of the single tube 11. Eventually, as shown in Figure 3, spacing baffles 11a and 11b can also be formed as stiffeners to prevent squashing inflections of the front and rear walls of the hollow body 1. In the embodiment shown, these additional
15 stiffening spacers 11a and 11b are defined in the form of vertical wings or ribs extending from the cylindrical surface of the through passing ventilation tube 11. Of course, even curved spacers or of any other shape and orientation may be formed in order to confer to the load bearing hollow body structure of the machine adequate characteristics of rigidity and strength.

20 Another plurality of through passing conduits 12, 13, 14, 14, 16 and 17, all having a slit shaped cross section and a certain position and orientation is defined through the hollow molded body 1 for successively threading there through textile suspenders, waist and eventually also chest slings, forming the slinging of the knapsack blower-sprayer without employing rivets and/or metallic bolts, as will
25 be described in detail later.

While the tubular appendix 7, closed by the screw cap 2, serve for filling the hollow body 1 with a liquid to be sprayed, through the opening of the tubular appendix 8 may be installed inside the hollow body 1 a preformed tank 18 destined to contain the fuel of the internal-combustion engine of the centrifugal

fan, sealing or welding a rim portion of it around the opening of the tubular appendix 8, to be closed by a second screw cap 19.

More preferably, the fuel tank 18 is defined within the hollow body 1 during molding as it is possible to do with a rotational molding technique in a single operation, thus eliminating the need for a separate preforming a fuel tank 18 and the operations needed for functionally installing it inside the hollow body 1 and for sealing the rim joint.

The use of a high strength resin, commonly loaded with a pigment but in a quantity such to produce colored walls that remain sufficiently transparent, permits to observe the level of the liquid in their respective reservoir. In particular, on the flank of the molded body at the interior of which is defined the fuel tank 18, a measurement scale for assessing the quantity (level) of fuel present inside the tank 18 can be traced, as may be observed in the photograph of Figure 11.

The sideways slanting of the rims of the filling openings of the two reservoirs with respective liquids and the deliberately large diameters of the filling openings, help in preventing accidental spillages of liquids on the slinging, on the back rest padding, on the generally hot engine surfaces and on other functional parts of the knapsack machine during refills.

While the effects of the lapping of the fuel inside the fuel tank is negligible because of the relatively small cross section of the internal tank 18, made to extend substantially in a vertical direction, the peculiar shape of the internal fillable volume of the hollow body 1, the horizontal cross section of which gradually restricts on approaching the top, above a base portion that markedly expands on a horizontal plane, the presence of a vertically extending narrow fuel tank 18, of the group through passing conduits 12, 13, 14, 15, 16 and 17, of the through passing ventilation tube 11 and of other stiffening spacers 11a and 11b, provides an effective hindrance to the lapping of the liquid contained inside the hollow body 1. In this way, the intensity of stresses that would be rhythmically transmitted to the bearer's chest is remarkably reduced.

Preferably, around the quarter-moon shaped base portion 3 of the hollow body 1, is defined a semicircular necking or channel 20 for anchoring the machine on an accessorial transportation pedestal. Such anchoring accessory for transporting the blower-sprayer of this invention on a vehicle, is depicted in Figure 8 and its function may be observed in Figure 9 and in the photographs of Figures 10 and 11.

With reference to Figure 8, a pedestal for example of stainless steel plate 21 can be stably fastened with screws or bolts over a flat load surface of a common vehicle, and has a wrapping tubular railing composed by a fixed part or trunk 22a and by a hinged mobile part or trunk 22b. The wrapping railing 22a+22b is designed to fit inside the semicircular necking 20 of the outer rim of the base portion 3 of the hollow body of the knapsack blower-sprayer, such that, after a rotation of the machine rested on the pedestal by about 90° in order to bring it to a stop against the end peg 22d of the tubular railing, the machine is stably anchored onto the pedestal in an upright position. An accidental counter rotation that would free the base portion 3 of the hollow body is prevented by tightening the blocking screw pommel 23 that tightens the mobile trunk 22b of the tubular rail advancing the end tip which is telescopically accommodated inside the cylindrical sleeve 22c or by any other equivalent blocking device that makes the wrapping railing 22a + 22b tightening into the receiving necking 20 of the base portion 3 of the hollow body, as depicted in Figure 9.

In this way, the knapsack blower-sprayer can be transported safely in upright position without any possibility of accidentally flipping over, as may be observed in the photograph of Figure 11.

The back side wall of the hollow body 1 has a concave (recessed) area, centered on the axis of the through passing ventilation tube 11 and over which the preassembled group composed by the centrifugal fan 23 and by its internal-combustion engine 24, is mounted by employing three or more antivibration supports 25 of a suitable elastomer in order to dampen transmission of vibrations to

the supporting hollow body 1, as observed in the exploded rear view of Figure 3.

The fastening of the engine-centrifugal fan group over the concave or recessed area of the rear wall of the hollow body 1 is preferably established by tightening screw ends of the antivibration supports 25 in threaded ferrules sunk in the thickness of the resin of the back wall of the hollow body 1, according to common
5 fabrication practices, and there after by tightening fastening nuts on threaded free ends of the antivibration supports 25, passed through holes of an annular assembling flange 26 of the casing of the centrifugal fan 23.

Fixed onto the exterior surface of the front wall of the hollow body 1 there is a
10 padded back rest 28, removably fastened to the hollow body 1 by automatic buttons or equivalent fastening devices permitting eventual replacement of the padded back rest 28 if ruined.

The padding of the back rest 28 defines a recessed cove portion 29 open at the top having a plurality of holes 10 in its central area, practically coinciding with the
15 opening of the ventilation tube 21 across the hollow body. In this way, air is sucked by the centrifugal fan through the holes 10 of the padded back rest 28 and through the tube 11. The air intake mouth of the centrifugal fan, centered onto the opening of the ventilation tube 11 on the outer surface of the back wall of the hollow body 1, sucks air through the holes 10 and through the gap space between
20 the holed central recessed bottom of the padded back rest 28 and the back of the bearer, in correspondence of the recessed core portion 29 of the padding, open at the top.

Suspenders 37 and the slings or belts 38 that form the slinging are commonly of a fire resistant high strength textile ribbon, provided with padded rests, threaded
25 through the respective tubular slit conduits 12, 13, 14, 15, 16 and 17. Common stoppers of plastic material are used for preventing unthreading of the textile suspenders and slings passing through the respective tubular conduits, eliminating the need for metallic fasteners.

Of course, the suspenders and the slings have appropriate paddings, regulation and quick release devices of any suitable known type, as may be observed in the photograph of Figure 14.

As shown in Figure 15, the preferred presence of a second sling 38a at chest level,
5 beside the common waist sling 38, further improves restraintment of the knapsack blower-sprayer to the chest of the bearer, significantly reducing the possibility of joltings and shakings. The additional chest sling 38a prevents the suspenders to spread apart because of the shouldered weight and thus limit the freedom of movement of the arms.

10 The extension of the base portion 3 of the hollow body 1 in a quarter-moon shape, besides providing an ample surface for a stable standing on the ground of the blower-sprayer in an upright position, provides for a practical footrest under the overhanging engine-centrifugal fan assembly, on which an anti slip rubber surfacing can be applied, for example by gluing it. The machine can comfortably
15 be heldfast to the ground by placing a foot on the footrest when manually starting the internal-combustion engine by pulling vertically up the start-up cord, as may be observed in the photograph of Figure 13.

Moreover, in correspondence of the rearmost apex of the base portion 3 of the hollow body 1 of the machine, a recess may be formed in the bottom wall of the
20 base portion 3 for receiving the fingers of a hand, thus providing a useful secondary bottom handgrip 30, as may be observed in the photograph of Figure 12. This bottom handgrip 30 facilitates the action of a workmate of the bearer in helping to lift the blower-sprayer onto the shoulder and back of the companion, especially when already filled with the liquids, as well as for helping the bearer in
25 stepping over obstacles of some difficulty, by unburdening from part of the weight the bearer of the blower-sprayer. Of course, the additional bottom handgrip is also useful when pouring off liquid or emptying the tanks.

The tangential air outlet of the centrifugal fan 23 is customarily connected to an elbow conduit 31, to which, through a flexible rubber joint, is connected the

delivery tube 32, having a handle 33 in which are commonly installed a speed control device of the internal-combustion engine, a push button of delivery of the liquid through the sprayer nozzle and a stop switch or push button for arresting the internal-combustion engine.

- 5 The fuel supply hose to the internal-combustion engine 24 can be observed in Figures 1, 5 and 9. Of course, the hose adapter coupling 39 installed through the wall of the hollow body 1 may internally connect to a dip pipe reaching the bottom of the fuel tank defined by a dividing wall generated during the molding of the hollow body or to a hose connected to the bottom of a separately formed fuel
10 tank successively installed inside the hollow body of the blower-sprayer. Preferably, the fuel tank is pressurized through the hose 35 that connects the interior of the of the casing of the centrifugal fan 23 to the upper gas pocket part of the fuel tank through the hose coupling 34.

- The injection of liquid to be sprayed, atomized and carried by the jet stream of
15 blown air takes place through a common nozzle (not illustrated in the figure) installed inside and in proximity of the outlet mouth of the jet orienting tube 32. Similarly to the above described mechanism of delivery of fuel to the internal-combustion engine, the liquid to be sprayed is injected in the blown air stream by the combined sucking action of the liquid out of the release nozzle by
20 Venturimetric effect, purposely enhanced by suitably shaping the air flow passage of the blown air around the liquid release nozzle, and of the pressurization of the liquid contained inside the hollow body 1, obtained by connecting the top of the hollow body (above the free level of the liquid contained therein) containing the liquid to the pressurized interior of the casing of the centrifugal fan.

- 25 As may be observed in Figure 6, through the hose 36a and the hose coupling 42 passing through the wall of the hollow body, the interior of the hollow body is connected to the interior of the casing of the centrifugal fan 23 where air is pressurized. Through the hose coupling 41 and the hose 36 (also indicated in Figures 1, 2, 3, 7 and 9), the liquid is supplied to the sprayer nozzle.

The above techniques are normally embodied in this type of knapsack blower-sprayer and are well known to an expert technician.

5 Firefighting operations and successive quelling of residual charcoals using knapsack blower-sprayer are normally carried out by teams of at least two operators, the first carrying and using the sprayer while the companion follows him carrying a refill of water or of liquid to be sprayed. The reserve water tank carried by the aide may of course have a similar constitution and functional shape of the hollow body 1 of the blower-sprayer.

10 The water refill tank may in practice be a hollow body ergonomically identical to the hollow body of the sprayer-blower, optionally have a distinct fuel tank fitted internally therein for enhanced safety, as well as the same type of slinging. The presence of the concave (recessed) area in the back wall of the hollow molded body may, in this case, be exploited for transporting ancillary equipments such as a radio transceiver, drinking water bottles, shears, etc, that may be securely
15 retained by applying over the recessed area a common holding net provided with an elastic brace. In this way, the same mold can be used for fabricating the hollow bodies for the blower-sprayer and for the water refill tank.

CLAIMS

1. Knapsack blower-sprayer comprising a load bearing structure provided with suspenders and slings, a tank for the liquid to be sprayed, a centrifugal air fan driven by an internal-combustion engine, a fuel tank, a blown
5 air jet stream directional delivery tube with a control handle, characterized in that,
- i) said load bearing structure is constituted by an hollow body that extends for the whole height of the knapsack blower-sprayer, having a broadened base portion compared to a narrower top portion, forming a quarter-moon shaped rest basement, rearwise and frontwise extended
10 flanks in proximity of the point of joining with the broadened base, and a concave or recessed area on the outer surface of the rearwise wall of the hollow body, at the center of which is defined at least a ventilation tube, passing through the hollow body, open on the outer surfaces of the frontwise and rearwise walls of the hollow body;
- 15 ii) said hollow body has two liquid filling openings at the rims of two respective tubular appendices that project from the two sides of said narrower top of the hollow body, closed by screw caps, a first filling opening communicating with a fuel tank defined within the inner space of the hollow body for containing fuel delivered through a hose to the
20 engine of the centrifugal fan, the second liquid filling opening communicating with the inner space of the hollow body fillable with a liquid to be sprayed in contact with the outer surface of the fuel tank;
- 25 iii) the centrifugal fan is installed over said concave or recessed area with an axial air intake mouth of the centrifugal fan overhanging the opening of said ventilation tube at the center of said concave or recessed area.
2. Knapsack blower-sprayer according to claim 1, wherein a plurality of through passing conduits, all having a slit shaped cross section and each having a certain position and orientation, is defined through the hollow body for threading there through a textile ribbon constituting said suspenders and slings forming a

slinging of the knapsack blower-sprayer.

3. Knapsack blower-sprayer according to claim 1, wherein around said broadened base portion there is a semicircular necking or channel that is engaged by a wrapping tubular railing having a fixed part or trunk and a hinged tightenable
5 mobile part or trunk of an accessorial transportation pedestal fixed on a loading surface of a vehicle for securely holding the knapsack blower-sprayer in a upright position.

4. Knapsack blower-sprayer according to claim 1, wherein said tubular appendices are divergent and have a sideway slanting rim.

10 5. Knapsack blower-sprayer according to claim 1, wherein a central handgrip is defined between the two tubular appendices for lifting up and carry the blower-sprayer with one hand.

6. Knapsack blower-sprayer according to claim 1, wherein a padded back rest is removably fastened to the hollow body, the padding of which defines
15 a recessed cove portion open at the top and having a plurality of ventilation holes in a central area coinciding with the opening of said ventilation tube across the hollow body for sucking air in contact with the back of the bearer.

7. Knapsack blower-sprayer according to claim 1, wherein in correspondence of the rearmost apex of the base portion of the hollow body, a
20 recess formed in the bottom wall of the base portion 3 for receiving the fingers of a hand provides for a secondary bottom handgrip for helping to lift the blower-sprayer onto the shoulder and back of the bearer and for pouring off liquids.

8. Knapsack blower-sprayer according to claim 1, wherein said hollow body is of plastic material formed in a mold.

25 9. Knapsack blower-sprayer according to claim 1, wherein stoppers of plastic material are used for preventing unthreading of the textile ribbons of said suspenders and slings threaded through the respective tubular conduits.

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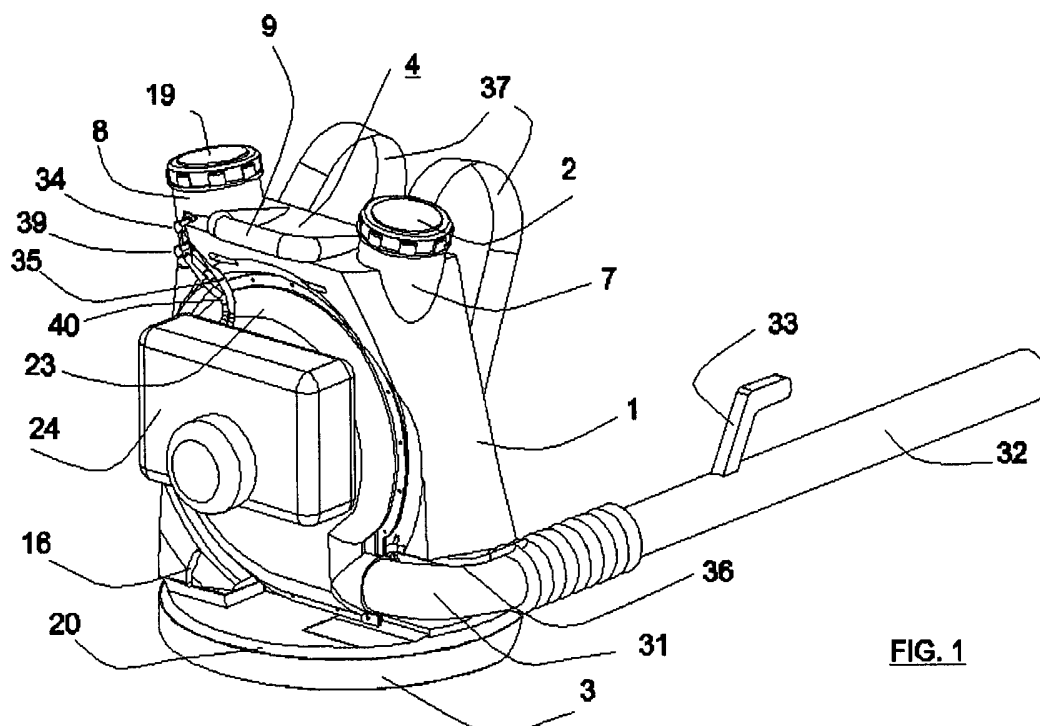


FIG. 1

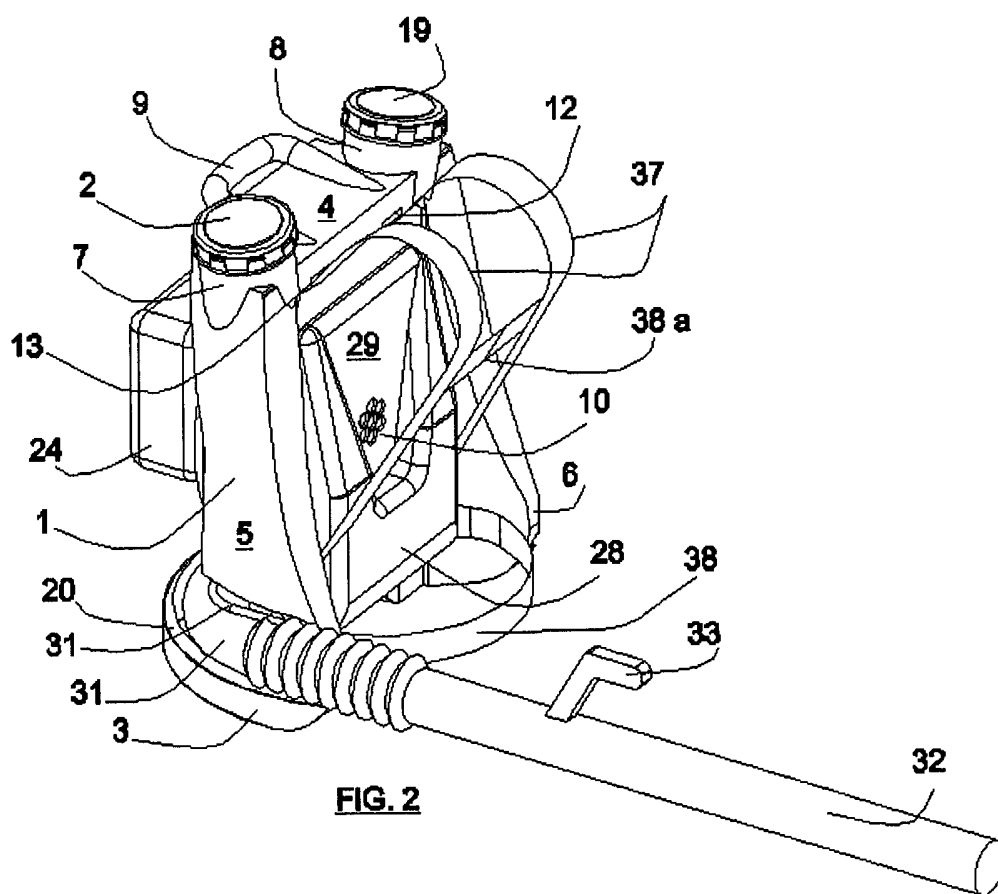
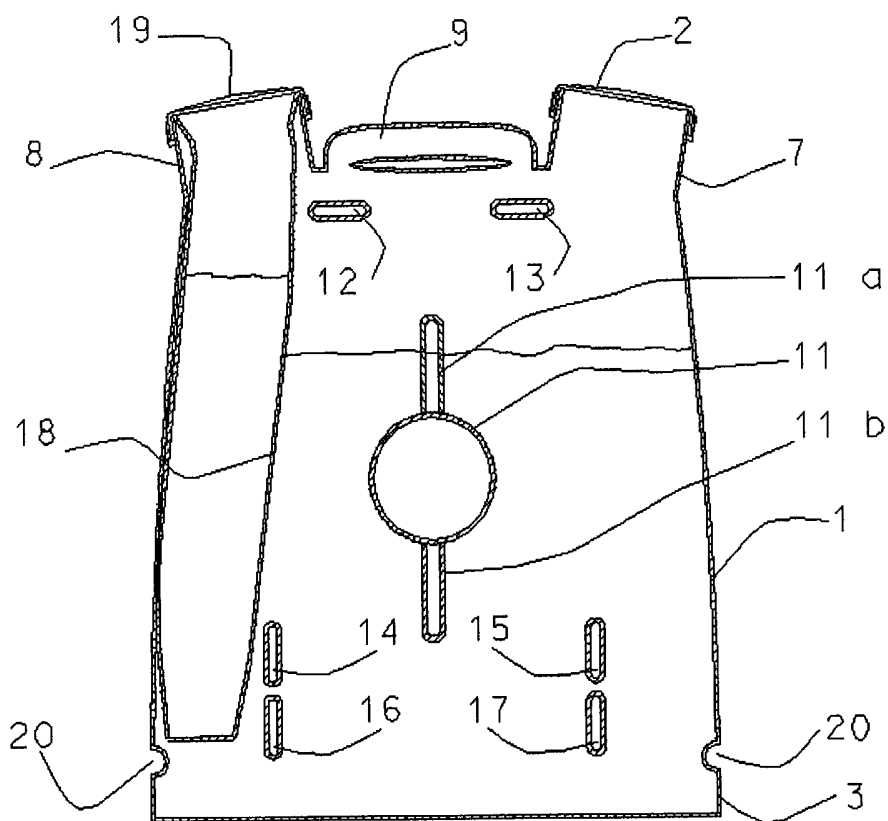
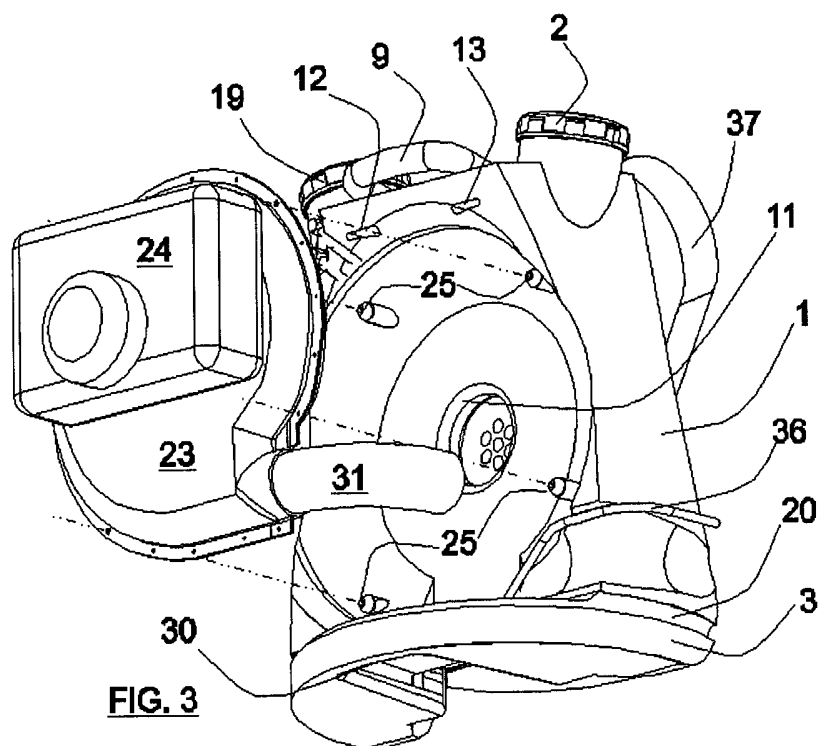


FIG. 2

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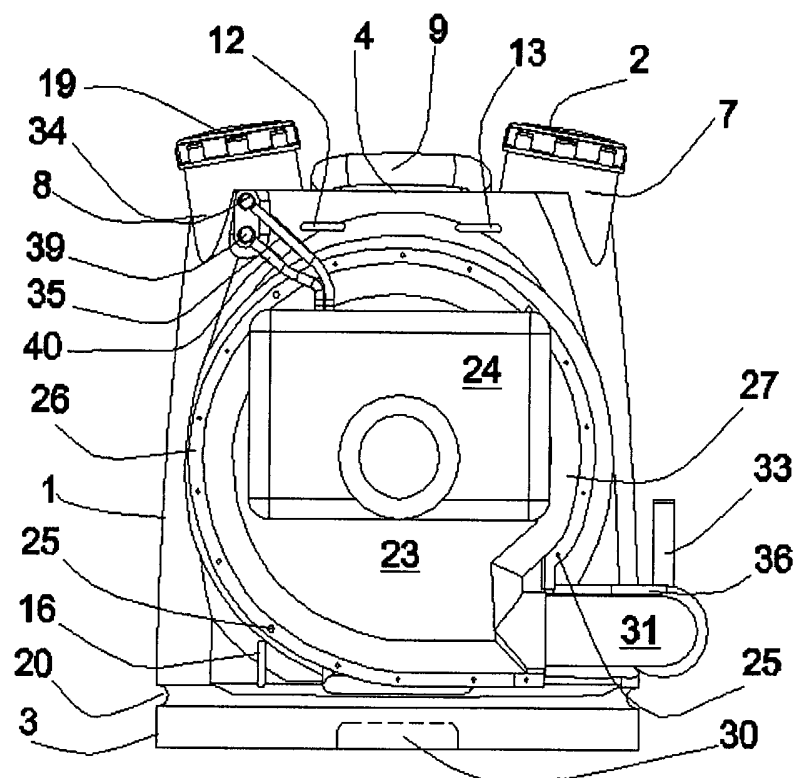


FIG. 5

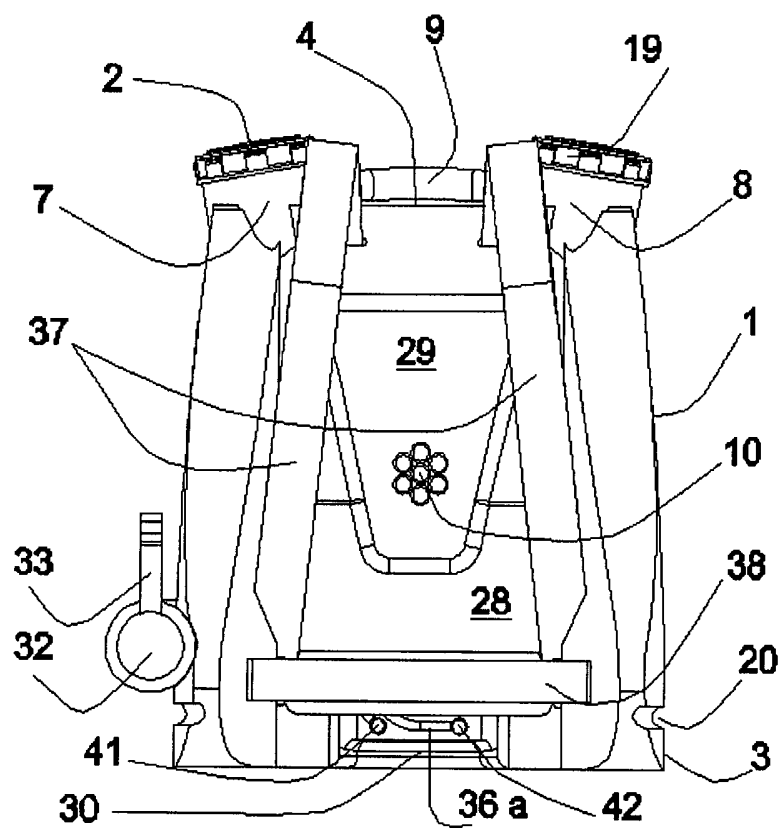
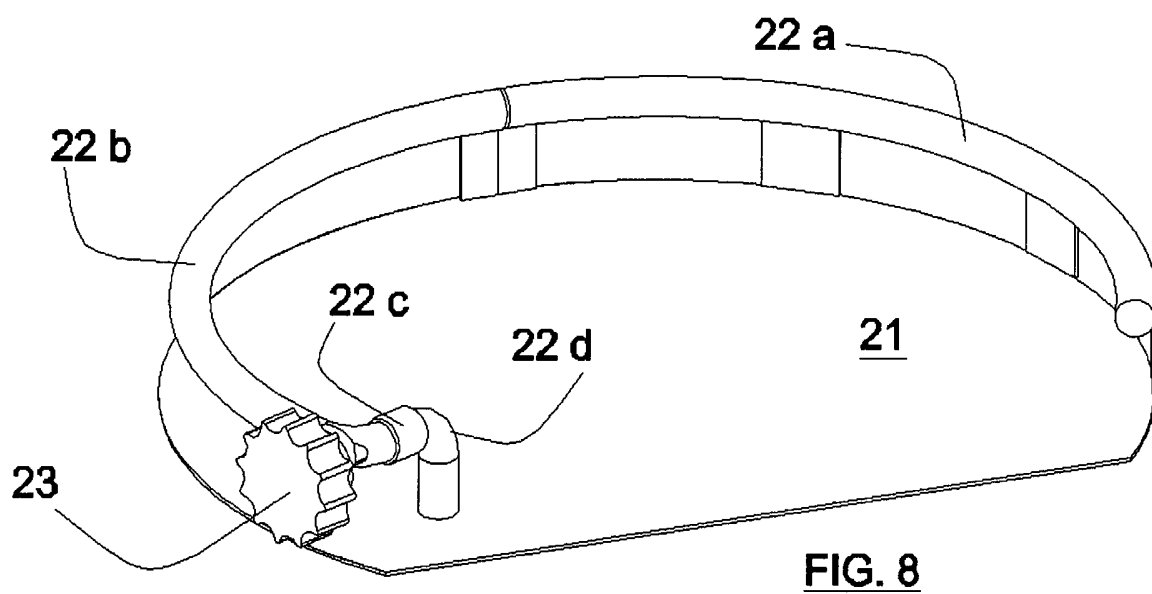
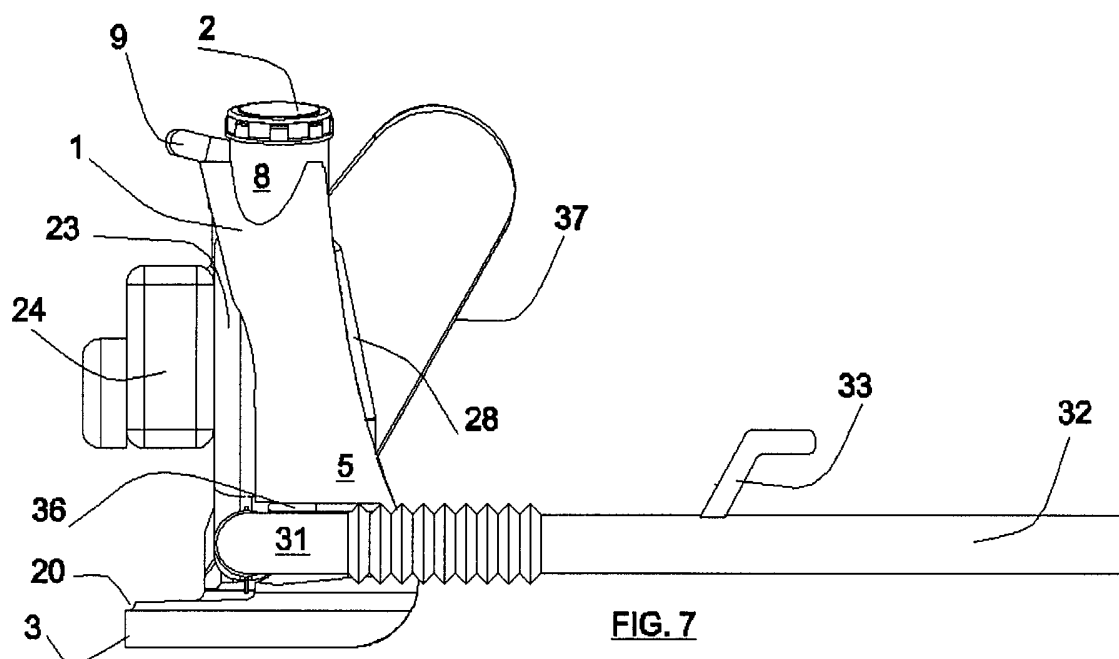
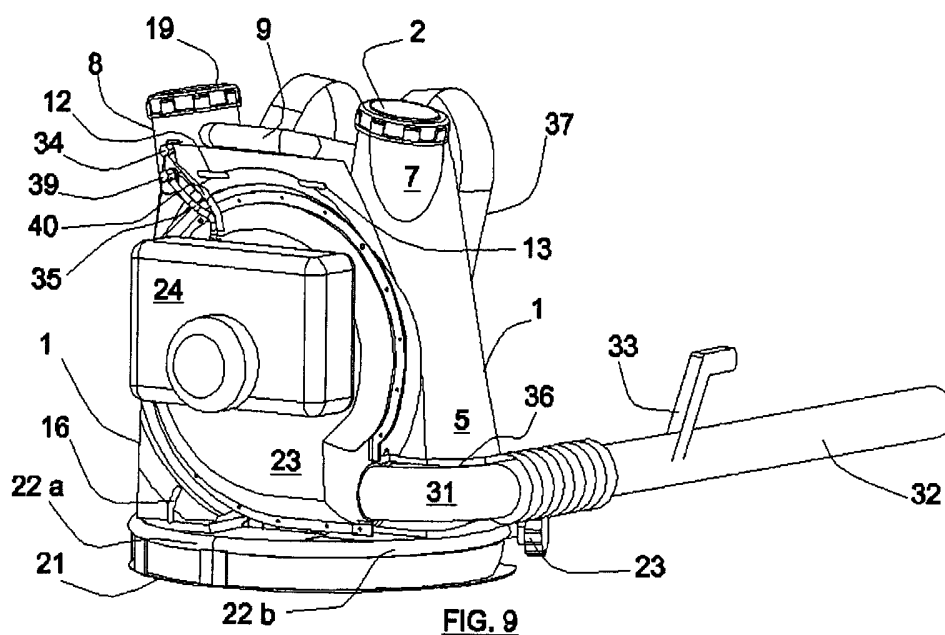


FIG. 6

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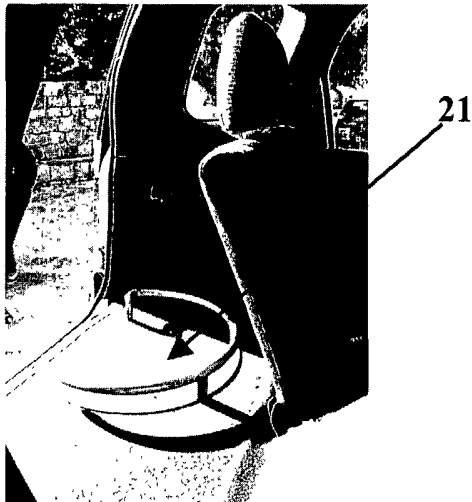


FIG. 10

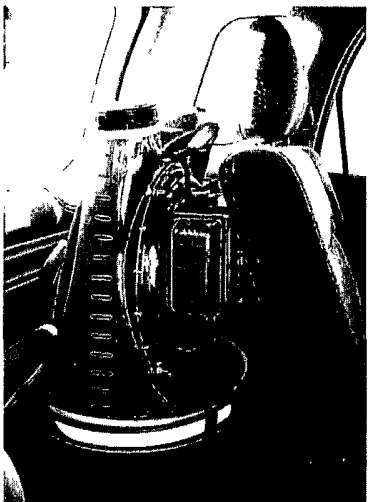


FIG. 11

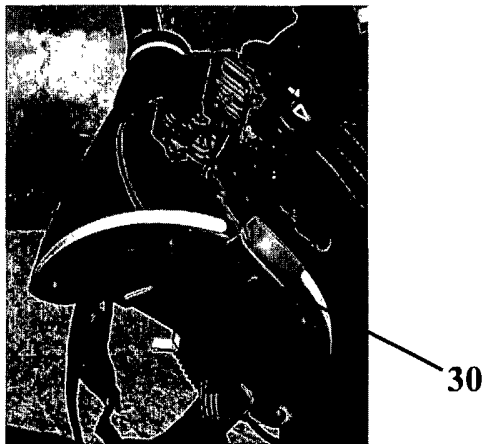


FIG. 12



FIG. 13

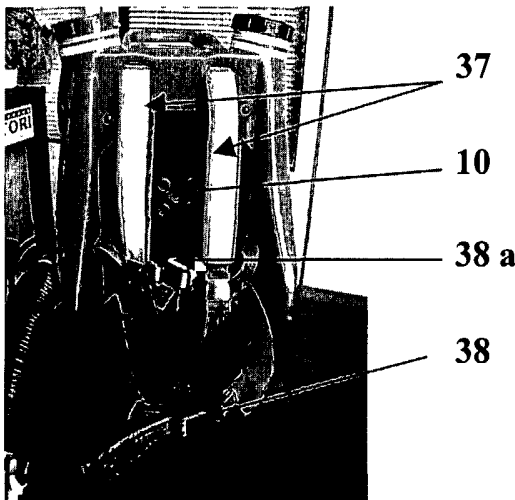


FIG. 14

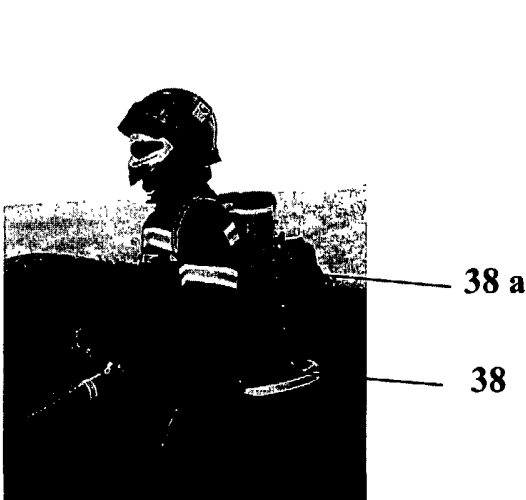


FIG. 15