



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
23.08.2000 Bulletin 2000/34

(51) Int Cl.7: **B05B 15/06**

(21) Application number: **99301224.4**

(22) Date of filing: **19.02.1999**

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE
 Designated Extension States:
AL LT LV MK RO SI

• **Itsuka, Yoshitsune**
Yokohoma-shi, Kanagawa-ken (JP)

(74) Representative: **Allen, Philippa Margaret et al**
Markgraaf Patents Limited
The Crescent
54 Blossom Street
York YO24 1AP (GB)

(71) Applicant: **Sankyo Ryokka Company Limited**
Tokyo (JP)

(72) Inventors:
 • **Ishida, Mitsuo, Dr.**
Yokohama-Shi, Kanagawa-ken (JP)

(54) **Fluid dispenser having dispensing conduit of variable length and movable nozzle portion**

(57) The object of the invention is to provide a compact spraying apparatus making it possible to easily store a flexible tube (2) when it is not in use, to freely change spraying direction of fluid and to spray chemicals on an object in the distance in any direction and/or into a narrow opening, to control wasps, bugs, cockroaches, microorganisms and weeds, and to effectively spray chemicals for various purposes.

An apparatus for dispensing fluid on a remote and/or poorly accessible object or locus, comprising a flexi-

ble tube (2) and a telescopic rod (1) or rod antenna structure comprising plural pipe rods (1a) telescopically connected one to another and loosely fitted into an operating pole, the tube (2) having a length greater than that of the telescopic structure (1) in extended state, the tube (2) having a front end connected to the base of a nozzle member (9) provided at the front end of the foremost pipe rod and a base end connected to an ejection control trigger (4) which is attachable to or detachable from a valve stem of a reservoir (3) of fluid to be dispensed.

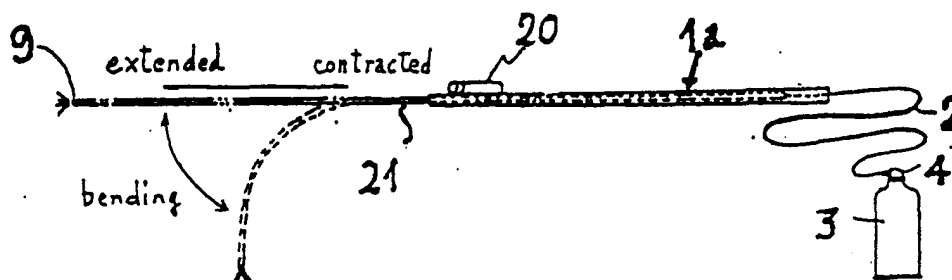


Fig.11

Description

[0001] This invention relates to an improvement in an apparatus for spraying chemicals on an object in a distant place and/or into a narrow opening.

[Prior Art and Problems that the Invention is to Solve]

[0002] The known apparatuses of this kind for spraying chemicals on an object in a distant place include an apparatus in which a front end of a coiled flexible tube is connected to an ejection head fixed to a front end of an expansible rod provided independently of the flexible tube, a base end of the flexible tube being connected to a nozzle pressing cap fixed to a nozzle member of an aerosol bomb so that the flexible tube expands in accordance with the expansion of the rod, the chemicals in the bomb being sprayed in an atomized state from the ejection head when the nozzle pressing cap is pressed. (For example, refer to Japanese Utility Model Laid-Open Nos. 32959/1990 and 27652/1994).

[0003] In a conventional apparatus of this kind described above, an expansible rod and a flexible tube have separately formed structures. Consequently, a stable controllability of the apparatus as a whole is low, and, moreover, while the apparatus is operated, the flexible tube interferes with another part and disengages from the nozzle member and the ejection head, whereby a chemicals spraying efficiency is lowered in some cases. Also, forming a means for urging the flexible tube so that the tube is stored in a coiled state is complicated, and this causes the cost of manufacturing the apparatus as a whole to increase. Therefore, such an apparatus is economically disadvantageous.

[0004] The known apparatuses of this kind for spraying chemicals into a narrow opening include an apparatus in which a fine, non-flexible steel pipe whose length usually does not exceed 15cm is connected to an aerosol valve or an apparatus in which a nozzle member whose thickness is usually not less than 1.5cm is connected to spray means such as a manual or automatic pressure atomizer. These pipe or nozzle members can not be inserted into deep, narrow and winding openings or holes existing sometimes in the distance where unpleasant animals such as wasps, cockroaches, moles, snakes and a variety of microorganisms live.

[0005] An aerosol spraying auxiliary tool is disclosed in the official gazette of Japanese Utility Model Laid-Open No. 141809/1976 as means for solving the above problem of the prior art. Though the auxiliary tool solves the conventional technical problem previously described, it is inconvenient to handle the tool because there is no means for storing a free long flexible tube when it is not used because a telescopic rod is contracted. Moreover, because the spray direction is specified in the direction perpendicular to the central axis of the telescopic rod, a problem that the purpose is limited is not solved.

[0006] It is an object of the present invention to provide a compact spraying apparatus making it possible to easily store a flexible tube when it is not used, to spray chemicals on an object in the distance in any direction and/or into a narrow opening, to control wasps, bugs, cockroaches, microorganisms and weeds, and to effectively spray chemicals for various purposes.

[0007] According to a first aspect of the invention there is therefore provided an apparatus for spraying chemicals on an object in the distance and/or into a narrow opening, comprising a flexible tube longer than a most-expanded operating pole of a telescopic rod structure or a rod antenna structure made by telescopically connecting plural pipe rods one another and loosely fitted into the operating pole and whose front end is connected to the base of a nozzle member provided at the front end of the foremost pipe rod and whose base end is connected to an ejection control button which can be attached to or detached from a valve stem of an aerosol bomb or spray means such as a manual or automatic pressure atomizer at the side of the base end pipe rod forming the operating pole. This apparatus is hereinafter designated "basic spray wand".

[0008] Preferably the nozzle member can be tilted, bent or rotated to the basic spray wand.

[0009] The foremost pipe rod of the operating pole may be fixed or removable and made out of plastics material that can keep its bent state.

[0010] A part or the whole of the foremost pipe rod of the operating pole may be made out of a flexible tube covered by a plastic tube that can keep its bent state.

[0011] The basic spray wand may comprise a foremost pipe rod forming the operating pole which is constituted with a plastic tube whose bent state is kept and to whose front end a nozzle member is set and the base of the plastic tube is fixedly or removably connected to the flexible tube of the next stage pipe rod.

[0012] In a further aspect, the invention provides an apparatus for spraying chemicals on an object in a distant place and/or into a narrow opening, in which a flexible tube longer than a most-expanded operating pole of a telescopic rod structure or a rod antenna structure made by telescopically connected plural pipe rods one is loosely fitted into the operating pole, a pipe having a chemicals channel perpendicular to the central axis of a foremost pipe rod forming the operating pole is provided at the front end of the foremost pipe rod, a shell provided with a nozzle member connecting with the chemicals channel is rotatably set to the pipe having the chemicals channel, and an ejection control button which can be attached to or detached from a valve stem of an aerosol bomb or spray means such as a manual or automatic pressure atomizer is provided at the base end of the flexible tube.

[0013] In a further aspect, the invention provides an apparatus for spraying chemicals on an object in a distant place and/or into a narrow opening, in which a pipe rod made of an elastic and flexible material such as a

fine stainless steel pipe and longer than a comparatively long operating pole made of a hard material is inserted into the operating pole with a rod antenna structure and the front end of a flexible tube having an ejection control button which can be attached to or detached from a valve stem of an aerosol bomb or spray means such as a manual or automatic pressure atomizer is connected to the base of the pipe rod.

[0014] The apparatus may further comprise fixed or removable protective means for avoiding an attack of noxious animals such as wasps and snakes on any place of operating poles when used for controlling harmful animals.

[0015] The apparatus may further comprise a longer flexible tube a part of which is coiled on the surface of the base-end part of the operating pole, at a hand grip part, in the basic spray wand to ease possible plant leaf frostbite.

[0016] The apparatus may further comprise a fixed or removable lighting means such as a small flashlamp on the foremost pipe rod forming an operating pole in order to throw light over the place on which chemicals are sprayed.

[0017] In its broadest aspect the apparatus of the invention for dispensing fluid on a remote and/or poorly accessible object or locus, comprises an elongate operating pole having means for conveying fluid from a base end to a front end thereof, the fluid conveying means having at the base end a connection for a reservoir of fluid and being connected at the front end to a nozzle member, the apparatus being of variable length and suitable for dispensing fluid in any direction. The means for conveying fluid is suitably a tube or channel.

[0018] A reservoir of fluid is suitably a reservoir which is suited to be attached and removed from the apparatus prior to or following use or for the purpose of replenishing the fluid supply. Preferred reservoirs include aerosol bombs or spray cans such as manual or automatic pressure atomizers.

[0019] In a yet further aspect there is provided a kit of parts forming an apparatus as hereinbefore defined.

[0020] In a yet further aspect there is provided according to the invention a method for dispensing fluid using an apparatus as hereinbefore defined.

[0021] A fluid as hereinbefore defined may be any natural or synthetic substance and is preferably a chemical or a chemical solution such as an insecticide, bactericide, plant growth regulator, fungicide, herbicide, repellent for flies, mosquitos, cockroaches or termites, fertilizer, deodorant for a public lavatory or a lavatory of a public transport such as rolling stock including train carriages, stables and the like, repellent for cats, mice, doves, detergent for cleaning windows and lighting, such as theatre or shopfront illumination or chandeliers in high vaults or ceilings.

[0022] A fluid as hereinbefore defined is suitably any vapour, gas, liquid or flowable fine solid such as a powder or mixture thereof. The fluid is preferably suitable

for dispensing by dosing or spraying and is preferably a spray solution for a manual or automatic pressure atomizer.

[0023] In a yet further aspect there is provided an object or locus dispensed with a fluid using the apparatus or method as hereinbefore defined.

[0024] An object as hereinbefore defined may be any animate or inanimate object on which it is desired to dispense fluid and is preferably a horticultural or agricultural object such as a plant or tree or other crop, a husbandry or domestic animal, an agricultural, domestic or industrial pest such as a plant infestation, wasp, snake, mole, cockroach, mouse, rat and the like, a domestic or industrial object to be cleaned, maintained, painted such as a window, light, piece of machinery, appliance, furniture and the like. A locus as hereinbefore defined may be any locus for an object as hereinbefore defined or a locus from or to which it is intended to repel or attract an animate object as hereinbefore defined. It is a particular advantage that the invention allows access for dispensing via narrow apertures.

[0025] In a yet further aspect there is provided the use of an apparatus or method as hereinbefore defined in dispensing fluid on an object or locus as hereinbefore defined.

[0026] An embodiment of the present invention will now be described with reference to the drawings.

[0027] The details of the basic construction of the present invention will be described with reference to Figs. 1-4. A reference numeral 1 denotes an operating pole of a telescopic rod structure or a rod antenna structure formed by connecting plural pipe rods 1a to one another so that the pipe rods can be expanded and contracted. In the interior of this operating pole 1, a flexible tube 2 the length of which is longer than that of the operating pole in a maximally expanded state is inserted loosely as shown in Fig.3. A front end of the flexible tube 2 is fixed to a front end of the foremost pipe rod 1a, and a base end portion of the flexible tube 2 can be fixed detachably to, for example, a valve stem 3a of an aerosol bomb 3 and is provided with an ejection control button 4 communicating with the flexible tube 2. The nozzle member is designated as 9.

[0028] Fig. 2 shows an extended state of an operating pole which consists of five pipe rods.

[0029] Fig. 3 is a section drawing of a part of operating pole showing a telescopically connected pipe rods 1a in which a flexible tube 2 is passing.

[0030] Fig. 4 shows the construction of a nozzle member 9 provided at a front end portion of the foremost pipe rod 1a constituting the operating pole 1. The nozzle member 9 has at its base portion a swinging part 9a of a spherical structure having a diameter larger than that of the nozzle member 9 and formed integrally therewith, and the swinging part 9a is supported swingably on a seat 10 of a hemispherically recessed structure formed in the pipe rod, the swinging part 9a being engaged slidably at its base portion with the surfaces of plural small

hemispherical projections 8 provided on a base port of the seat 10. The seat 10 is provided at its open end portion with a stepped part 7, on which an O-ring 6 air-tightly contacting an outer circumferential surface of the swinging part 9a is provided so as to permit the chemicals advancing in the pipe rod 1a to be ejected from the nozzle member 9 to the outside and so as to prevent the chemicals from being discharged from a narrow clearance between the swinging part 9a and seat 10 to the outside. Referring to the drawing, a reference numeral 5 denotes a nut screwed to the front end portion of the pipe rod 1a so as to press the O-ring 6.

[0031] A connecting means capable of being engaged and disengaged in one action will now be described with reference to Fig. 5. A reference numeral 11 denotes an ejection button body fixed detachably to a valve stem 3a of an aerosol bomb 3 and provided with a horizontal cylindrical ejection nozzle member 11a in a projecting state. An airtightness retaining O-ring 12 is fitted around a front end portion of the ejection nozzle member 11a, and a pin 13 is implanted in one side of a base portion of the ejection nozzle member 11a. A cylindrical connecting member 14 fitted detachably around the ejection nozzle member 11a and having a cylindrical locking portion 14a slidingly contacting the O-ring 12 is fixed to a base portion of the flexible tube 2. The cylindrical locking portion 14a is provided at its open end with an L-shaped locking bore 15 in which the pin 13 is to be fitted. The connecting member 14 is joined to the ejection nozzle member 11a firmly in one action by guiding the pin 13 into the locking bore 15 and fitting the same in a bent portion 15a thereof, and the chemicals sent out from the aerosol bomb when the ejection button body 11 is pressed is sprayed from the nozzle member 9 through the flexible tube 2. In this embodiment, the connecting member 14 is substituted for the ejection control button 4 of the embodiment shown in Fig. 1, and the ejection button body 11 used specially for the valve stem 3a is provided. Namely, in the embodiment of Fig. 5, the connecting member 14 and ejection button body 11 can be engaged with and disengaged from each other in one action.

[0032] In the case of the embodiment shown in Figs. 6 and 7, part or almost the whole of a foremost pipe rod 1a forming an operating pole 1 uses a tubular plastic part 16 instead of making the nozzle member shown in Fig. 4 tiltable and rotatable. The plastic part 16 uses a metallic tube or plastic material having a bellows structure capable of keeping a bent state and its outside diameter is made equal to the diameter of the pipe rod 1a and the flexible tube 2 is loosely inserted into the hollow portion of the part 16 so that the part 16 is bent in any direction at any angle including a right angle as shown by a virtual line. In Figs. 6 and 7, symbol 9b represents a nozzle member. Moreover, as shown in Fig. 7, the foremost pipe rod 1a constituted as the above mentioned is removably connected to the next-stage pipe rod 1a as an adapter. In this case, it is free to form the plastic part

16 constituting the foremost pipe rod 1a into a mere hollow structure by securing the forefront of the flexible tube 2 to the front end of the next-stage pipe rod 1a or store a flexible tube (not illustrated) connecting with the forefront of the flexible tube 2.

[0033] Fig. 8 shows another type of rotatory nozzle member which consists of 2 parts of nozzle head, 9a (swinging) and 9c (fixed). Between the two parts there exists a rotatory mechanism 17.

[0034] Fig. 9 also shows another type of flexible nozzle member which consists of two stages and a spiral spring installed between the stages. The stage 18a is fixed to the foremost pipe rod 1a, on the other side the front stage 18b is supported by the stage 18a with both the spiral spring 19 and the flexible tube 2 whose front end is connected to a nozzle head 25. Owing to the spiral spring, spray direction can be easily changed by pulling down the flexible tube at the base end of the operating pole.

[0035] Fig. 11 shows a basic model of an apparatus for spraying chemicals into a narrow opening. This model consists of a hard pipe rod 1a in which a flexible pipe 21 such as stainless steel pipe connected at the base-end to a flexible tube 2 is inserted. The flexible tube is connected to an ejection control button for an aerosol bomb 3. For the flexible pipe 21, a fine pipe which can be bent to the extent of 90 degree is selected so as to make its insertion into narrow and complicated openings easy. Though the frontend of the fine pipe rod 21 is usually open, it is also possible to set a nozzle member 9 to the front end if necessary. A flashlamp 20 is mounted on the pipe rod 1a for lighting a narrow opening.

[0036] Fig. 14 shows a basic spray wand on which an enemy protective mean 25 is installed for avoiding an attack of harmful animals such as wasps and snakes.

[0037] Fig. 15 shows the inside of a hand grip installed at the base end of operating pole of another modified model of basic spray wand. Symbol 1b represents a grip cover mounted on the operating pole 1a. On this grip cover 1b a relatively long part of flexible tube 2 whose function is the same as that in Fig. 1 is coiled. Symbol 1c represents the second grip covering the coiled part of flexible tube 2.

[Description of functions]

[0038] Functions of the embodiments shown in Fig. 4, 6, 7, 8, 9 and 11 are described below by referring to Fig. 10(a,b,c). As shown in Fig. 10a, a person can accurately spray chemicals in a free stance by changing the tilt angle of the nozzle member in accordance with the height of a wasp nest and the position of a nest hole. Moreover, because it is possible to easily and directly insert the nozzle member into the nesting hole, consumption of chemicals can be minimized. Furthermore, as shown in Fig. 10b, it is possible to decrease the time for controlling underground noxious insects and animals by changing the direction of the nozzle member or the flexible pipe

rod to a direction in which the nozzle member can easily be inserted into holes of favorite haunts of noxious animals such as moles, mole crickets, termites and cockroaches, so that a person can spray chemicals in a free stance. Furthermore, to control noxious insects such as beetles whose nest hole is difficult to find, it is possible to use a needle-like pipe rod shown in Fig. 11 and inserting it into ground. Fig. 10c illustrates a person who is spraying chemicals from an aerosol bomb against caterpillars such as *Hyphantria cunea* on a tall tree by using a spray wand at its most expanded state.

[Description of function]

[0039] Functions of the embodiment shown in Fig. 11 are described below by referring to Fig. 12 and 13. The flexible pipe rod 21 in Fig. 11 is made of selected materials such as fine stainless steel pipe so as to be tolerable collision against small obstacles or small projections in narrow openings on the one hand, and so as to be flexible enough for its insertion into narrow, bent and complicated openings on the other hand.

[0040] As shown in Fig. 12 which is a bird-eye view, a person can spray chemicals in a free stance by fully pulling out the pipe rod 21 from the operating pole 1a and inserting the pipe rod 21 into a narrow opening 24 between a room wall surface and the adjacent side board of a heavy furniture 22. As shown in Fig. 13 which is a side view, a person also can spray chemicals in a free stance by fully pulling out the pipe rod 21 from the operating pole 1a and inserting the pipe rod 21 into a small gap 24 between floor surface and the bottom of a large refrigerator 23.

[0041] Chemicals used in the form of an aerosol bomb or in the form of spray solutions for pressure atomizers include insecticide, bactericides, plant growth regulators, fungicides, herbicides, repellents for flies, mosquitos, cockroaches, or termites, fertilizers, deodorants for a public lavatory or a lavatory of a rolling stock, or a stable, repellents for cats, mice, and doves, and detergents for cleaning windows and illuminators such as a chandelier on high places.

[Effect of the Invention]

[0042] According to the construction mentioned above of the present invention, the following many effect [from (a) to (j)] can be expected.

(a) A front end portion of an elongated flexible tube which is fitted in an operating pole formed by connecting plural pipe rods to one another so that the pipe rods can be expanded and contracted, and which has a length longer than that of the operating pole in a maximally expanded state, is connected to a base portion of a nozzle member provided on a front end of the foremost pipe rod, and an ejection control button which is fixed detachably to the valve

stem of an aerosol bomb or spray means such as a manual or automatic pressure atomizer is provided on a base end portion of the flexible tube. Therefore, the protection of the flexible tube and the controlling of the apparatus as a whole during the use of the apparatus can be carried out effectively. Also the operation of the apparatus becomes stable and the apparatus becomes compact.

(b) The flexible tube can be stored conveniently while it is not in use.

(c) Since the nozzle member provided on a front end of the foremost pipe rod can be tilted, swung or bent, the direction in which the chemicals are sprayed can be set arbitrarily, and the chemicals spraying efficiency can be improved.

(d) The horizontal ejection nozzle member of the ejection button body provided on the valve stem of an aerosol bomb and the connecting member provided on the base portion of the flexible tube are engaged with and disengaged from each other in one action. This enables the chemicals spraying efficiency to be improved, and a chemicals spraying operation to be carried out conveniently.

(e) This apparatus is effective in controlling a wasp nest on a high place, and can prevent by a simple means an attack of wasps on a user which will fly toward him along the pipe rods. This apparatus is also very convenient for spraying chemicals on troublesome-to-reach targets such as tall trees, dense gardens and stinking horse stables.

(f) When chemicals are sprayed directly from an aerosol bomb on plants, plant leaves and/or flowers may suffer from frostbite because the temperature of the spray solution from the aerosol bomb nearby the spray nozzle becomes very low. Therefore, a caution written on a label of spray bomb usually emphasizes that spraying must be carried out approx. 30cm apart from the object. However, when chemicals are sprayed from a distant place by using an expanded operating pole, frostbite do not occur because the chemical solution is warmed while passing through a pipe rod and thereby, the temperature nearby an ejection hole is properly elevated. Moreover, when a modified spray wand shown in Fig. 15 is used the length of flexible tube through which the chemical solution passes is long enough to elevated the temperature of solution at the spray nozzle. Consequently, possible frostbite can be avoided.

(g) When using one of flexible nozzle member shown in Fig. 4-9 to spray chemicals on a wasp nest hole, the direction of the nozzle can be changed in accordance with the position of the hole. Therefore, a person can accurately spray chemicals in a free stance. Moreover, since it is easy to directly insert a nozzle member into the hole, the amount of chemical solution can be saved.

(h) Because chemicals can be sprayed by changing the direction of the nozzle member so that the nozzle

zle member can easily be inserted into a hole of moles or mole crickets, it is possible to decrease the time for eradicating underground noxious insects or animals. Moreover, to eliminate a noxious insect such as beetle whose nesting hole is difficult to find, it is possible to easily spray or inject chemicals into ground by using needle-like pipe rod shown in Fig. 11.

(i) A person can spray chemicals in a free stance by fully pulling out a pipe rod from an operating pole of a spray wand shown in Fig. 11 and inserting the pipe rod into a narrow opening between a room wall surface and the adjacent side board of a heavy furniture. A person also can spray chemicals in a free stance by fully pulling out the pipe rod from the operating pole and inserting the pipe rod into a small gap between floor surface and the bottom of a large refrigerator. These places in narrow openings or gaps are places where chemicals can not be easily and effectively applied. On the other hand, these places are very suitable for living or nesting of noxious animals such as cockraches, termites and rats, and unpleasant microorganisms.

(j) By using a lighting means such as a flashlamp shown in Fig.11 some of the purposes mentioned in (a) through (i) can be achieved very effectively.

[Designation of Document]

[Abstract]

[0043] [Problem] To provide a compact spraying apparatus which makes it possible to simply store a flexible tube when it is not use, freely change spraying directions of chemical solution, and effectively spray chemicals on an object in the distance and/or into a narrow opening.

[0044] [Means for Solving the Problem] An apparatus for spraying chemicals on an object in the distant place and/or into a narrow opening, comprising a flexible tube (2) longer than a most -expanded operating pole (1) of a telescopic rod structure or a rod antenna structure made by telescopically connecting plural pipe rods (1a) one another and loosely fitted into the operating pole (1) and whose front end is connected to the base of a nozzle member (9) provided at front end of a foremost pipe rod and an ejection control button (4) which can be attached to or detached from a valve stem (3a) of an aerosol bomb (3) or spray means such as a manual or automatic pressure atomizer.

[Brief Description of the Drawings]

[0045] [Fig. 1]

A front view showing the basic spray wand according to the present invention with pipe rods and a flexible tube in a contracted state.

[0046] [Fig. 2]

A front view showing the apparatus in operation.

[0047] [Fig. 3]

A section drawing of a part of operating pole and flexible tube.

[0048] [Fig. 4]

An enlarged sectional view of a nozzle member at a front end of the operating pole.

[0049] [Fig.5]

A partially cutaway front view showing a connecting means engageable with an ejection nozzle member in one action.

[0050] [Fig.6]

A front view of the essential portion of a foremost pipe rod which can be bent. [Fig.7]

[0051] A front view of the essential portion of a foremost pipe rod having an adapter structure.

[0052] [Fig.8]

An illustration for the mechanism of rotatory head of a nozzle member.

[0053] [Fig .9]

An illustration for the the mechanism of flexible head of a nozzle member.

[0054] [Fig.10a and 10b]

Illustrations showing a spray target and the position of nozzle member set for the target.

[0055] [Fig.11]

A front view showing a spray wand which is specially designed to be suitable for spraying into a narrow opening.

[0056] [Fig.12]

An illustration for a narrow place which is a spray target and exists between a room wall and a side board of heavy furniture.

[0057] [Fin.13]

An illustration for a narrow place which is a spray target and exists between a floor surface and the bottom of a large refrigerator.

[0058] [Fig. 14]

An explanatory drawing showing an example of protective means.

[0059] [Fig.15]

An illustration for the warming mechanism of chemical solution during its passing through a coiled flexible tube.

[Brief Description of the Symbols]

[0060]

[1] Operating pole

[1a] Pipe rod

[1b] Under grip cover

[1c] Over grip cover

[2] Flexible tube

[3] Aerosol bomb

[4] Ejection control button

[5] Nut screwed to pipe rod

[6] O-ring

[7] Stepped part

[8] Small hemispherical projection
 [9] Nozzle member
 [9a] Swinging part of nozzle member
 [9b] Nozzle orifice
 [9c] Fixed part of nozzle member
 [10] Swinging-part-receiving seat
 [11] Ejection button body
 [11a] Horizontal cylindrical ejection nozzle member
 [12] O-ring
 [13] Pin
 [14] Cylindrical connecting member
 [14a] Cylindrical locking portion
 [15] L-shaped locking bore
 [15a] Bent portion
 [16] Plastic part
 [17] Rotatory machinery
 [18a] Base stage
 [18b] Front stage
 [19] Spiral spring
 [20] Flashlamp
 [21] Flexible pipe rod
 [22] Heavy furniture or similar articles
 [23] Large refrigerator or similar articles
 [24] Narrow opening
 [25] Protector

Claims

1. An apparatus for dispensing fluid on a remote and/or poorly accessible object or locus and/or via a narrow aperture, comprising an elongate operating pole having means for conveying fluid from a base end to a front end thereof, the fluid conveying means preferably in the form of a tube or channel having at the base end a connection for a reservoir of fluid and being connected at the front end to a nozzle member, the apparatus being of variable length and suitable for dispensing fluid in any direction.
2. An apparatus for dispensing fluid on a remote and/or poorly accessible object or locus and/or via a narrow aperture, comprising a flexible tube and a telescopic rod or rod antenna structure comprising plural pipe rods telescopically connected one to another and loosely fitted into an operating pole, the tube having a length greater than that of the telescopic structure in extended state, the tube having a front end connected to the base of a nozzle member provided at the front end of the foremost pipe rod and a base end connected to an ejection control trigger which is attachable to or detachable from a valve stem of a reservoir of fluid to be dispensed.
3. An apparatus according to Claim 2 characterised in that the nozzle member can be tilted, bent or rotated.
4. An apparatus according to any of Claims 2 and 3 wherein a part or the whole of the foremost pipe rod forming the operating pole comprises a plastic material that is deformable in manner to keep its bent state.
5. An apparatus according to any of Claims 2 to 4 wherein part or the whole of the foremost pipe rod forming the operating pole is constituted with a flexible tube covered with a plastic tube which is deformable in manner to keep a bent state.
6. An apparatus according to any of Claims 2 to 5 wherein the foremost pipe rod forming the operating pole comprises a plastic tube which is deformable in manner to keep a bent state and having at the front end a nozzle member and the base of the plastic tube having a connection to the flexible tube of the next stage pipe rod.
7. An apparatus according to any of Claims 2 to 6 characterised in that the foremost pipe rod is removably connected to the adjacent pipe rod as an adaptor.
8. An apparatus for dispensing fluid on a remote or poorly accessible object or locus, and/or via a narrow aperture comprising a flexible tube and a telescopic rod or rod antenna structure comprising plural pipe rods telescopically connected one to another and loosely fitted into an operating pole, the tube having a length greater than that of the telescopic structure in extended state, in which the pipe having a fluid channel perpendicular to the central axis of a foremost pipe rod forming the operating pole is provided at the front end of the foremost pipe rod, a shell provided with a nozzle member connecting with the fluid channel is rotatably set to the pipe having the fluid channel, and an ejection control trigger which can be attached to or detached from a fluid reservoir is provided at the base end of the flexible tube.
9. An apparatus for dispensing fluid on a remote or poorly accessible object or locus, and/or via a narrow aperture wherein a pipe rod made of an elastic and flexible material is inserted into an operating pole of rod antenna structure made of a resilient material, the pipe having a length greater than that of the operating pole and the front end of a flexible tube having an ejection control button which can be attached to or detached from a reservoir of fluid is connected to the base of the pipe rod.
10. An apparatus according to any of Claims 1 to 9 characterised in that the reservoir is an aerosol bomb or spray can such as a manual or automatic pressure atomizer.

11. An apparatus according to any of Claims 1 to 10 further comprising fixed or removable protective means for avoiding an attack of noxious animals such as wasps and snakes is provided on any of the pipe rods forming the operating pole. 5
12. An apparatus according to any of Claims 1 to 11 additionally comprising insulating means in the form of a part of the flexible tube which is coiled around the outside surface of the base-end part of the rod forming the operating pole to maintain a desired temperature of fluid ejected from the nozzle thereby the risk of plant leaf frostbite caused by rapid evaporation of solvent. 10 15
13. An apparatus according to any of Claims 1 to 12 further comprising lighting means fixed or removably provided at the front end of a foremost pipe rod forming an operating pole to illuminate an object or locus onto which fluid is to be dispensed. 20
14. A method for dispensing fluid using an apparatus as hereinbefore defined, wherein the fluid is any vapour, gas, liquid or flowable fine solid such as a powder or mixture thereof, and is suitable for dispensing by dosing or spraying and is preferably a spray solution for a manual or automatic pressure atomizer. 25
15. A method according to Claim 14 wherein the fluid is any natural or synthetic substance and is preferably a chemical or a chemical solution such as an insecticide, bactericide, plant growth regulator, fungicide, herbicide, repellent for flies, mosquitos, cockroaches or termites, fertilizer, deodorant for a public lavatory or a lavatory of a public transport such as rolling stock including train carriages, stables and the like, repellent for cats, mice, doves, detergent for cleaning windows and lighting or other illumination such as theatre or shopfront lighting or chandeliers in high vaults or ceilings and hand held device is adapted to be incorporated into a glove. 30 35 40
16. A kit of parts forming an apparatus as hereinbefore defined. 45
17. An object or locus sprayed with a fluid using the apparatus or method as hereinbefore defined which is any animate or inanimate object which it is desired to spray and is preferably a horticultural or agricultural object such as a plant or tree or other crop, a husbandry or domestic animal, an agricultural, domestic or industrial pest such as a plant infestation, wasp, snake, mole, cockroach, mouse, rat and the like, a domestic or industrial object to be cleaned, maintained, painted such as a window, light, piece of machinery, appliance, furniture and the like or is any locus for an object as hereinbefore defined or a locus from or to which it is intended to repel or 50 55
- attract an animate object as hereinbefore defined.
18. The use of an apparatus or method as hereinbefore defined in dispensing fluid on an object or locus as hereinbefore defined.
19. An apparatus or method substantially as hereinbefore described in the description and figures.

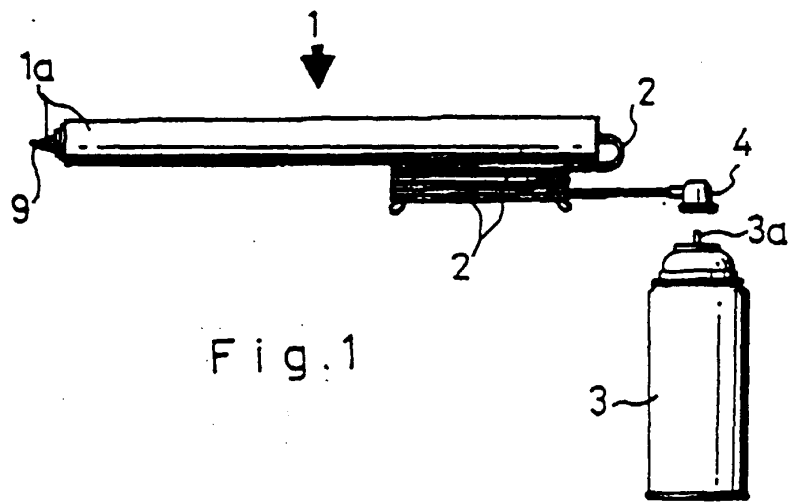


Fig. 1

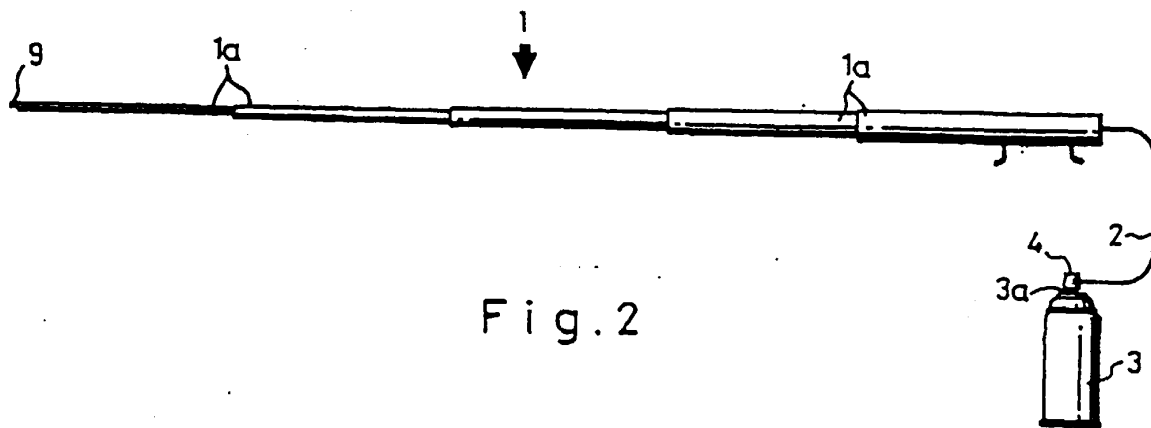


Fig. 2

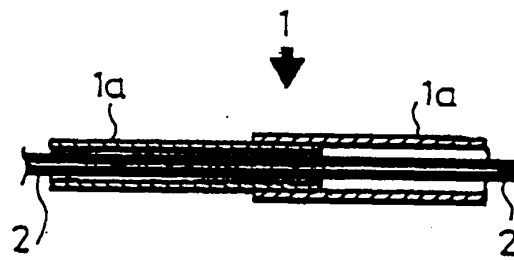


Fig. 3

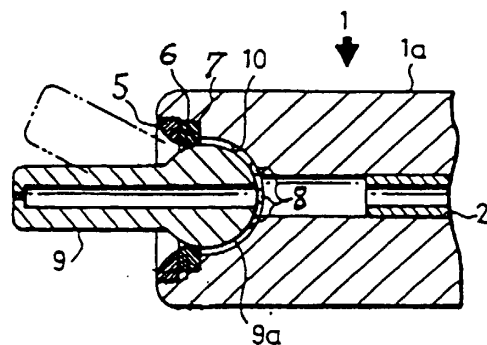


Fig. 4

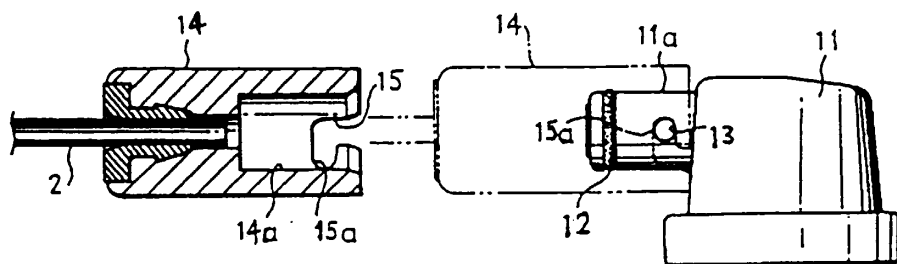


Fig. 5

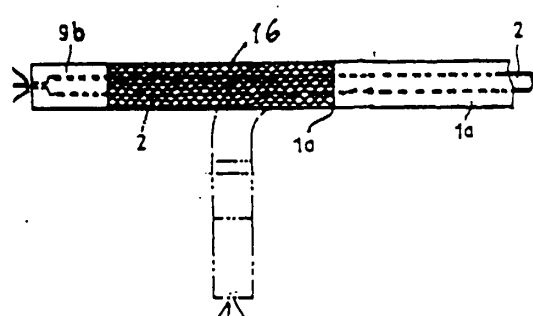


Fig. 6

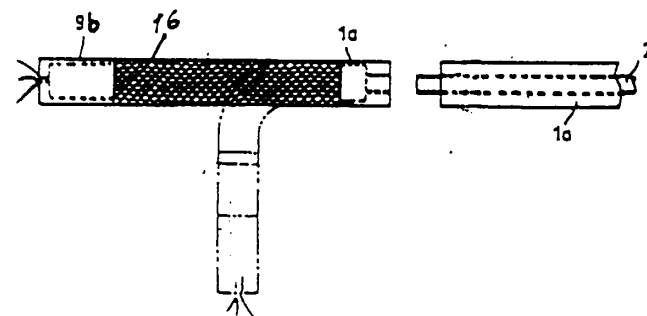


Fig. 7

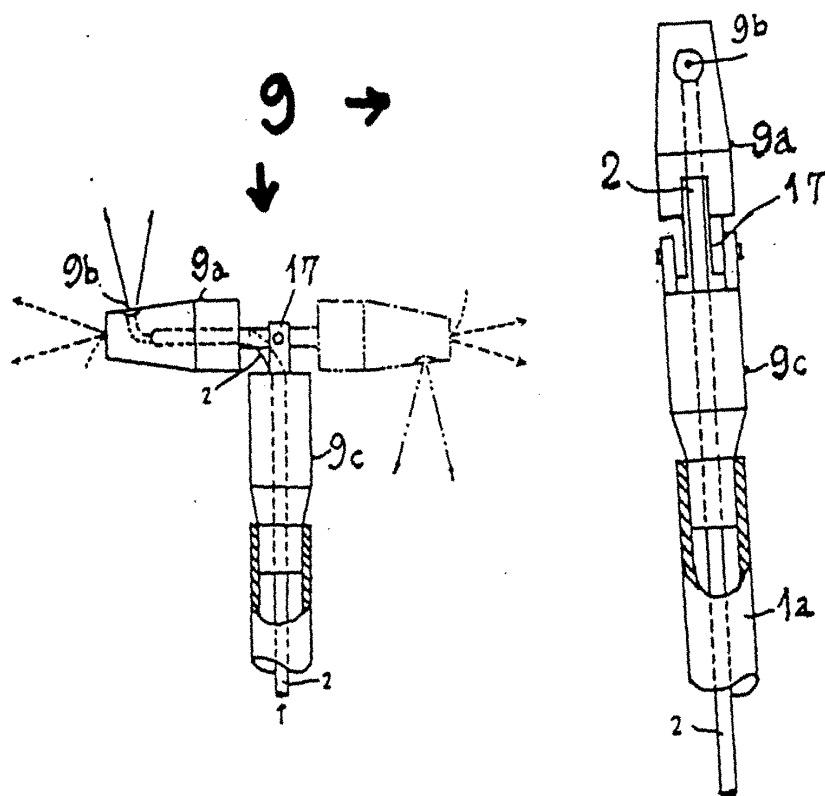


Fig. 8

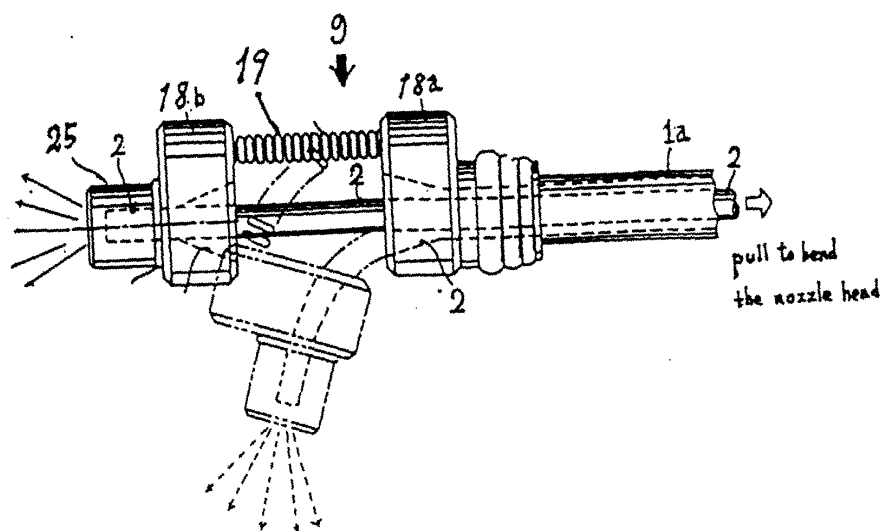
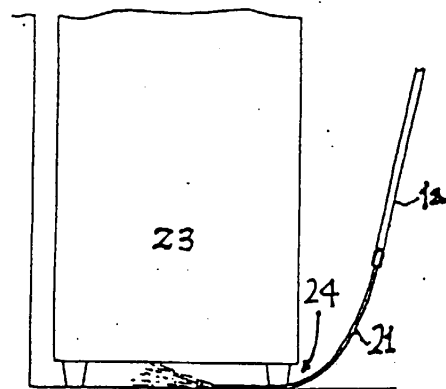
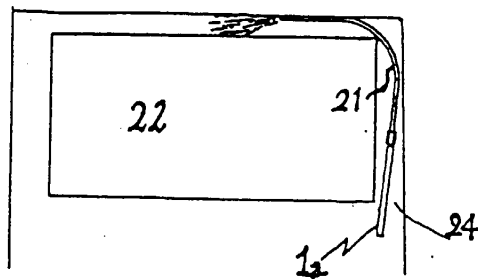
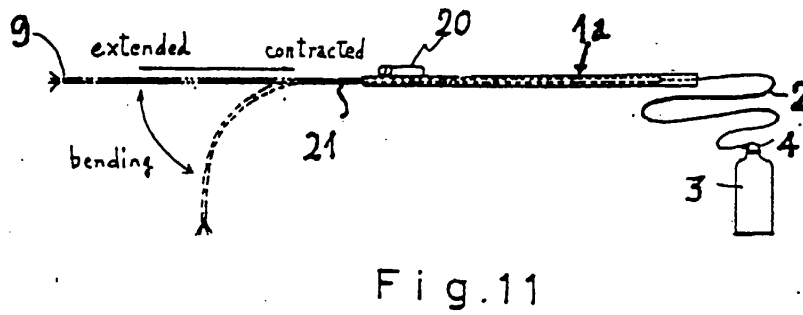
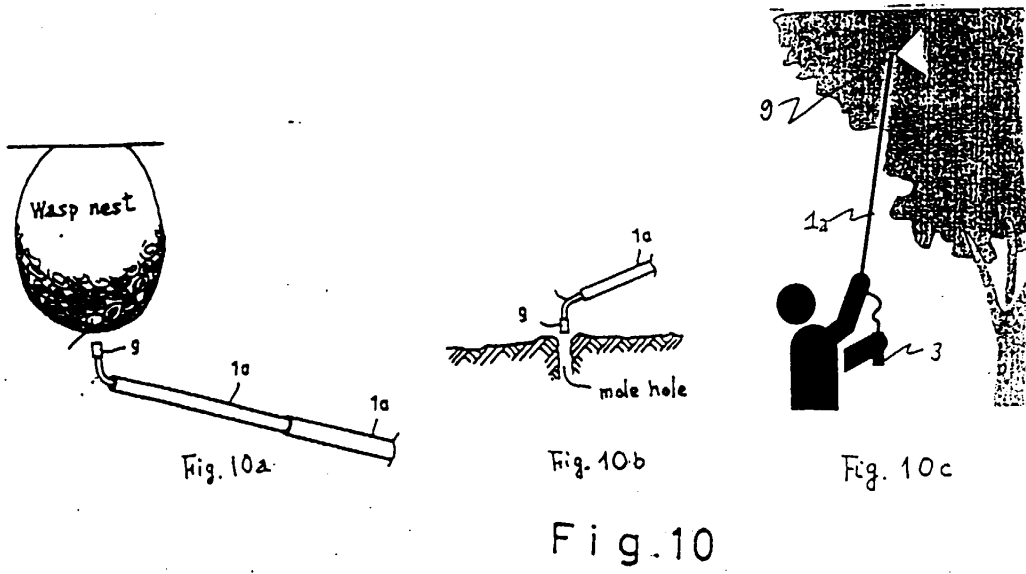


Fig. 9



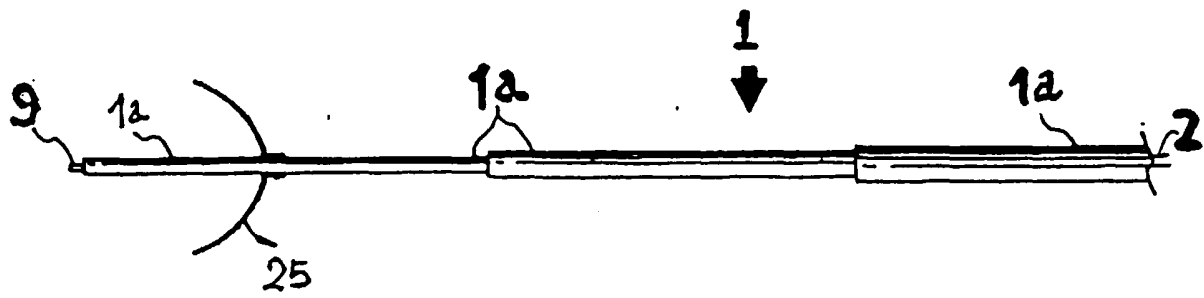


Fig. 14

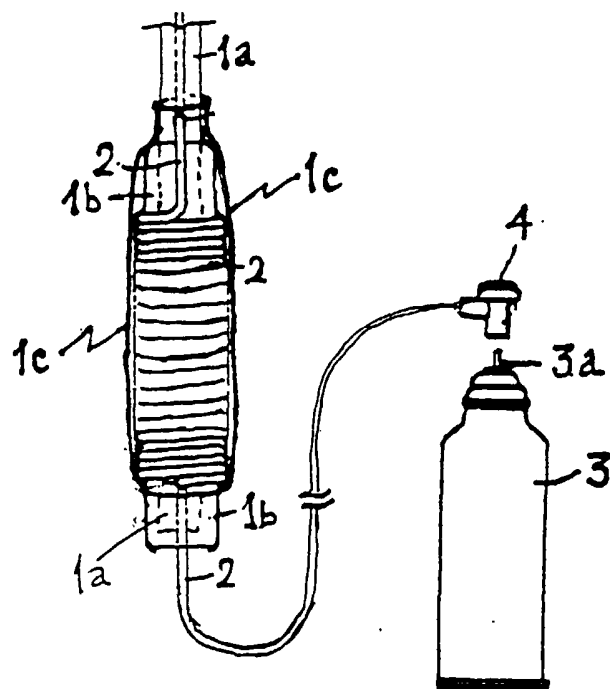


Fig. 15



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 99 30 1224

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The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 28 July 1999	Examiner Innecken, A
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