



(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 158(3) EPC

(43) Date of publication:
13.06.2007 Bulletin 2007/24

(51) Int Cl.:
B05C 17/005 (2006.01) **E04F 21/165** (2006.01)

(21) Application number: **04736839.4**

(86) International application number:
PCT/ES2004/000276

(22) Date of filing: **15.06.2004**

(87) International publication number:
WO 2006/005775 (19.01.2006 Gazette 2006/03)

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PL PT RO SE SI SK TR

(71) Applicant: **TEAIS, S.A.**
151152 Arteixo (ES)

(72) Inventor: **ANTELO PENSADO, Ernesto**
E-151152 Arteixo (ES)

(54) **MOTORISED APPLICATION GUN FOR SEALING JOINTS**

(57) The invention relates to a motorised application gun which is intended for the sealing of joints. The inventive gun comprises a hollow cylindrical inverted-T-shaped body (4) having three threaded ends such that it can be coupled to the outlet (1), the electric rotor of the power-generating device (7) and the filler neck (9). The inventive gun contains a screw conveyor (8) which is housed in the shaft of the rotor and which can rotate in

both directions together with the shaft depending on the position of the switch (10). In this way, by rotating in one direction, the screw conveyor mixes and homogenises the material to be applied, while, by rotating in the opposite direction, the conveyor moves the material and forces same through the outlet. The invention can be used without force in order to apply a continuous, constant flow of homogenous material, thereby producing uniform sealing beads.

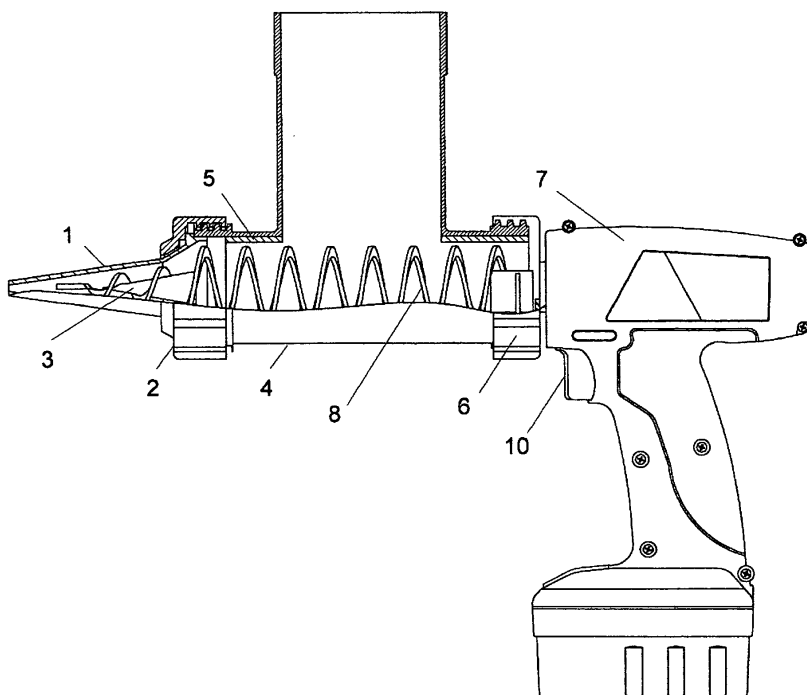


Figure 1

Description

[0001] The present invention relates to a motorized gun for applying fluid materials such as putty or mortar in sealing joints.

[0002] Due to their new system of electric rotor and helical transmission with capacity to turn in both directions, this gun allows with a single use, firstly to knead-mix the sealed fluid material, and later to apply it on the joints by means of an uniform and continuous bead, and this is the reason why it is of a great interest in the construction sector and, in general, in any task that requires the seal of cavities or holes between surfaces.

STATE OF THE ART.-

[0003] All the application systems of mortar or putty on joints known until now are eminently manual. They are fundamentally based on the expulsion of the material to apply by means of manual pressure of a flexible and deformable container that contains it, or by direct application of the putty with a brush.

[0004] The results thus obtained depend excessively on the experience, ability and coordination of the personnel who works with said systems; ie, qualified people are required so that the final finish does not suffer.

[0005] With the invention below described the referred problem is simplified to a great extent, since it has not only a comfortable and easy way to use motorized tool for joint sealing, but especially it is guaranteed a continuous and a constant flow of putty or kneading, with which the bead or layer of applied material is more homogenous and uniform, avoiding the only possibility of turning to personnel specialized.

THE INVENTION.-

[0006] Indeed, the object of the present invention is a motorized application gun for sealing joints, which comprises a grip, a power-generating device with electric rotor, whose power supply can be the mains, by means of a cable or of a rechargeable battery coupled to the base of the handle, a switch having three positions placed in the upper part of the grip, an outlet of fluid and a hollow cylindrical inverted-T-shaped body having three threaded ends on such a way that the body is coupled to the outlet by one of them, to the electric rotor of the motor by the opposed one, and to the mouth of the receiving container of the fluid by the top part, that constitutes the filler neck of the gun, being essentially characterized the gun to have a screw conveyor for metering and kneading which is housed in the shaft of the electric rotor, inside the cylindrical body, and which can rotate in both directions together with the shaft depending on to the position in which the switch stays pressed. In this way, by rotating in clockwise direction, the screw conveyor moves the flowed material to be applied and forces it through the outlet, by rotating in the opposite direction, the conveyor

mixes and homogenises said material.

[0007] The switch of the gun, located in the upper part of the grip, has three positions; in the rest position it does not produce any effect on the machine, meanwhile maintaining it pressed by the upper side, the electric rotor and therefore the screw conveyor rotate in one direction, and maintaining it pressed by the lower side, the rotor and the conveyor rotate in the opposite direction.

[0008] The screw conveyor of metering and kneading embraces on its front part to a conical piece incorporated inside the outlet to cause greater pressure when the fluid comes out.

[0009] The outlet, of plastic material and conic shaped, is coupled by its base to the cylindrical body of the gun, and it can be cut out on the opposed end to the base one until getting a flow section that guarantees the appropriate thickness of the bead of viscous fluid to be applied into service.

[0010] The gun can be constructed in any material, whether it be plastic, metallic or synthetic, in order to obtain the best results of durability, it is recommended that the screw conveyor should be made of steel to manganese, of high resistance to the abrasion, whereas the jacket that covers the interior of the cylindrical body should be made of polyethylene, in order to preserve the body from the frictional wear that it could be subjected by the conveyor in his movement of rotation.

[0011] The gun can be of all type of dimensions and weights, and it can apply different powers to the electric rotor.

[0012] The main advantage of this invention and that supposes an important improvement over all the prior systems is the incorporation to the traditionally manual gun of an electric rotor and screw conveyor system with capacity of turn in both directions, what makes this motorized gun with the double function of metering and kneading, due to when the rotor turns in a direction, it mixes and homogenises the material to be applied and when it rotates in the opposite direction, it moves said material and forces it through the outlet.

[0013] In this way not only it is automated the present procedure of application of materials flowed for the sealed one of meetings on the basis of the manual guns, but especially it offers the possibility of working with a continuous and constant flow of mortar throughout the outlet in order to obtain a bead or a layer of sealed material more homogenous and uniform, what avoids to have to turns to personnel specialized in order to obtain a nice final finish.

[0014] For the best understanding of the present invented motorized gun applicable to the joint sealing, it is accompanied, as **Figure 1**, an illustrative drawing in lateral section of his component elements and, among them, they are emphasized the outlet (1), the power-generating device (7), the cylindrical inverted-T-shaped body (4) with his three threaded ends, (2), (6) and (9), in order to be coupled to the outlet, the electrical motor and the filler neck of fluid material, respectively, the hollow

screw conveyor (8) for metering and kneading which, in common to the rotor electric of the motor, rotates voluntarily in both directions inside of the cylindrical body, and the conical piece (3) of the front part of the conveyor that increases the pressure of exit of the fluid.

OPERATION WAY.-

[0015] As it is showed in figure 1, the presented gun is provided with a grip where it is located the switch (10) which drives the electric rotor of the motor (7), in whose shaft it is fit the screw conveyor (8) which can rotate in both directions together with the rotor depending on the position that the switch adopts.

[0016] The switch (10) has three positions; in the rest one (position one) no effect is produced on the gun, which only starts up when the switch is pressed on its upper side (position two) or on its lower side (position three), stopping when it is released, thanks to an electric braking device. Whereas the switch is pressed by its upper side, that is, it stays in its position two, the electrical rotor and therefore the screw conveyor rotate in a direction, and maintaining it pressed by its lower side, the rotor and the conveyor rotate in the opposite direction. In this way the gun carries out its double functionality of, on the one hand, kneading and homogenising the fluid putty inside the cylindrical body and, on the other hand, pushing this putty towards the outlet for its expulsion, in order to apply it in the sealing joints.

[0017] The power supply of the power-generator of the gun can be the mains, by means of cable, but in order to make it more manageable and usable in any place, the gun has in the base of the grip a slots for connecting of a reloadable battery, which has ribbings that, when fitting itself in these slots, block it and maintain solidly holds to the machine.

[0018] In the cylindrical body and adapting to its inner diameter, it is founded a jacket (5) made of polyethylene in order to preserve the body from the wear that it could be subjected to by the conveyor in his movement of rotation, which is of steel to manganese, of high resistance to the abrasion.

[0019] The dimensions of the opening of the outlet come determined by the thickness from the layer or sealing bead that is necessary to apply. Due to the conical form of the outlet, this one will be cut voluntarily with a section that guarantees the appropriate thickness for the joint to be sealed.

[0020] The form in which the designed pistol works is the following one:

[0021] Firstly, the gun is filled by the filler neck of sealed material until ensuring that this one has reached the inner cavity of the cylindrical body. Once it has been done, it is enough to press the switch by its upper side to cause the turn of the rotor electric-screw conveyor in the opposite direction to the circle clockwise, with which the homogenization and kneading of the material flowed inside the cylindrical body take place. Afterwards, once ob-

tained the degree of suitable homogenization, one goes to press the switch by its lower side, being reversed the sense of the turn of the screw conveyor, which makes move the putty throughout the cylindrical body towards the outlet, expelling it towards the outside.

[0022] At the moment at which the material begins to be expelled by the outlet, the gun is aimed towards the zone of work, and the putty is applied to the surfaces to be sealed.

[0023] Once described the invention, with his referenced components to the drawings with enough clarity to carry out its production and putting in operation, it is declared as new and own invention, becoming the reservation of which its details, forms, size, materials, procedures of manufacture and applications, could be modified with regard to the things described and showed in the present memory, always within the unalterable essentiality that is summarized in the following ones:

Claims

1. Motorized application gun for sealing joints, constituted by a grip, a power-generating device with electric rotor (7), whose power supply can be the mains, by means of a cable or of a rechargeable battery coupled to the base of the handle, a switch (10) having three positions placed in the upper part of the grip, an outlet (1) of expulsion of fluid, a hollow cylindrical inverted-T-shaped body (4) having three threaded ends on such a way that the body (4) is coupled to the outlet by one (2) of them, to the electric rotor of the motor by the opposed one (6), and to the mouth of the receiving container of the fluid by the part on the top (9), that constitutes the filler neck of the gun, being **characterized essentially** this application gun because it has a screw conveyor for metering and kneading (8) which is housed in the shaft of the electric rotor, inside the cylindrical body (4), and which can rotate in both directions together with the shaft depending on to the position in which the switch stays pressed, this way, by rotating in clockwise direction, the screw conveyor moves the flowed material to be applied and forces it through the outlet, by rotating in the opposite direction, the conveyor mixes and homogenises said material.
2. Motorized application gun for sealing joints, according to the previous claim, wherein the switch (10) placed in the upper part of the grip is **characterized** because it has three positions; a first one rest position, in which no effect is produced in the gun, a second one obtained when maintaining pressed it by its upper side, in which the electric rotor and, thereby, the screw conveyor, rotate in a direction, and a third one consequence to maintain it pressed by its lower side, in which the rotating direction of the rotor-conveyor is opposite.

3. Motorized application gun for sealing joints, according to the first claim, **characterized** because the screw conveyor (8) embraces on its front part to a conical piece (3) housed inside the outlet (1).

5

4. Motorized application gun for sealing joints, according to the first claim, **characterized** because the outlet (1) of expulsion is made of plastic material and has conic shape, and is coupled by its base to the cylindrical body of the gun and it can be cut out on the opposed end to the base one until getting a flow section that guarantees the appropriate thickness of the bead of viscous fluid to be applied into service.

10

15

20

25

30

35

40

45

50

55

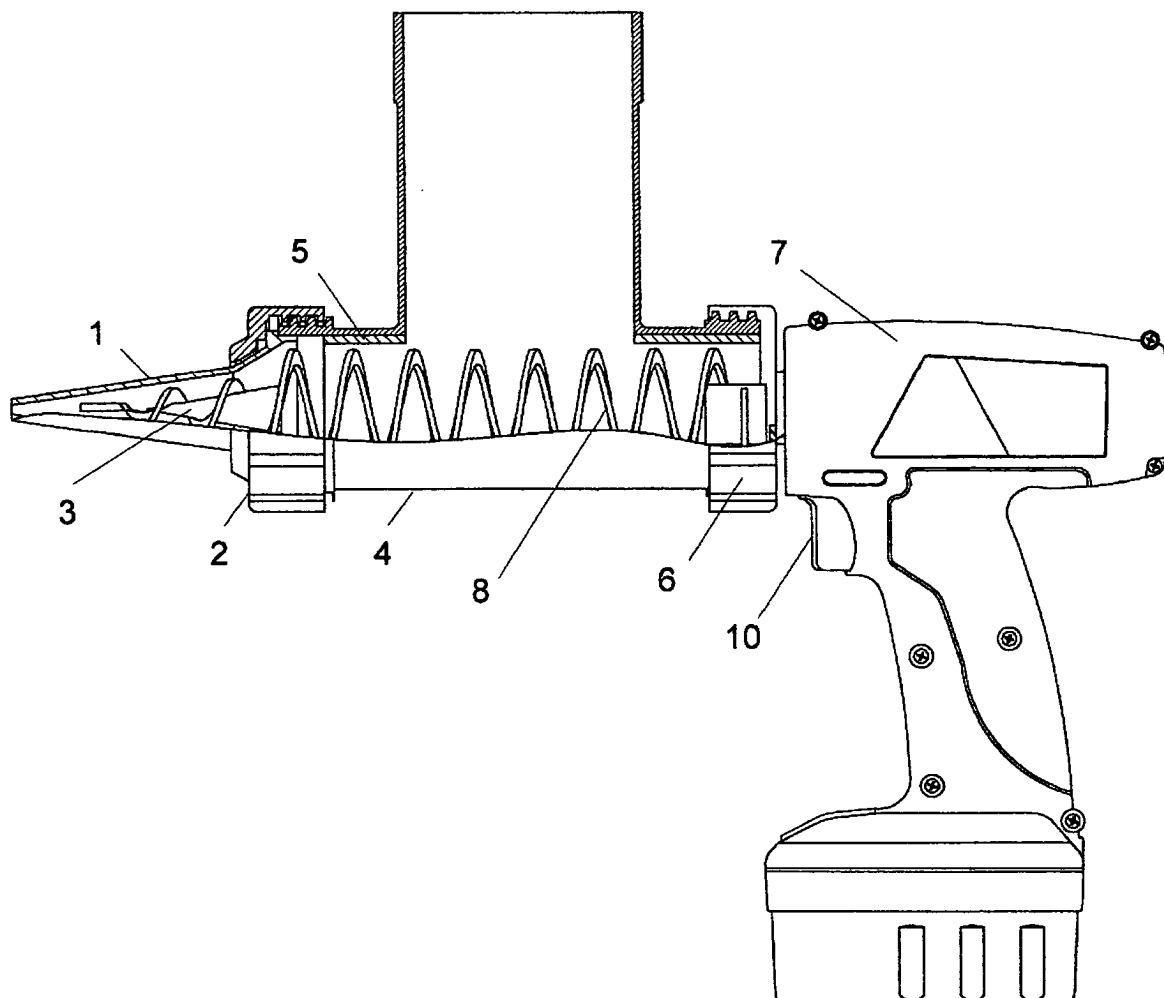


Figure 1

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ ES 2004/000276

A. CLASSIFICATION OF SUBJECT MATTER		
IPC.7 B05C 17/005 , E04F21/165		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols)		
IPC.7 B05C E04F		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
CIBEPAT,EPODOC, WPI, PAJ		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	US 5603435 A (FENWICK) 18.02.1997 the whole document	1, 2, 4 3
X Y A	US 6230936 B1 (LASKO) 15.05.2001. Column 3, line 54 - column 5, line 48; figures 4, 5, 7.	1 3 2
A	EP 1340553 A2 (HANS GUSTAVSSON I LUND) 03.09.2003. paragraphs 20-22, 24, 27, 29, 31, 39; figures 1-8	1, 2, 4
☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search		Date of mailing of the international search report
20 september 2004 (20.09.04)		29 september 2004 (29.09.04)
Name and mailing address of the ISA/ SPTO		Authorized officer
Facsimile No.		Telephone No.

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ ES 2004/000276

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claims Nos.: n^{os}. 5
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/ ES 2004/000276

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5603435 A	18.02.1997	WO 9403279 A EP 0773839 AB EP 19940906747 DE 69331936 D	17.02.1994 21.05.1997 06.08.1993 20.06.2002
US 6230936 B	15.05.2001	US 6223950 B	01.05.2001
EP 1340553 A	03.09.2003	SE 0200623 A EP 20030003985	02.09.2003 22.02.2003

Form PCT/ISA/210 (patent family annex) (July 1992)