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(54) **Device for the distribution of pasty products, such as plasters or mortars, particularly for building works**

(57) The device comprises a portable container (1) with a support handle (2) and with a lower oblique cone (101), equipped with a discharge nozzle (3) of suitable section. The pasty product is put in said container and is delivered from the nozzle of said cone by means of a

compressed-air ejector (206-13) which is controlled by a valve means (4) which is preferably located on said handle (2).

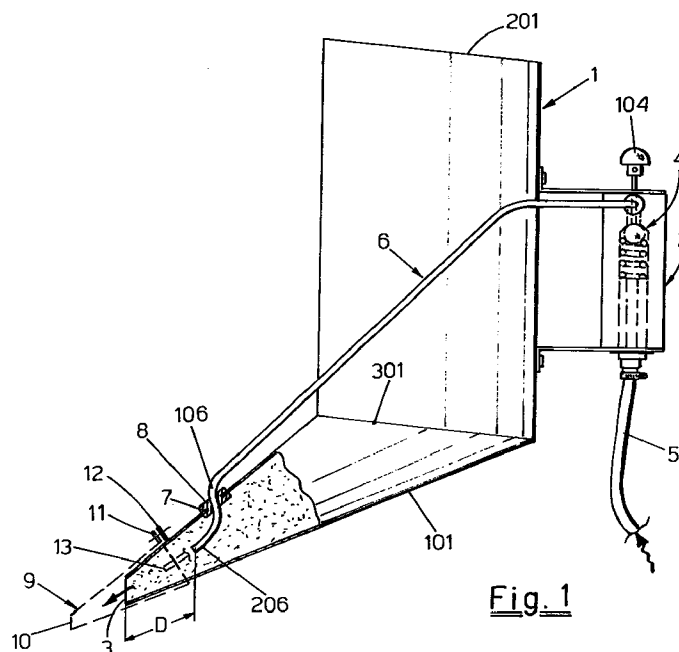


Fig. 1

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Description

The invention relates to a device of considerably simplified construction and of great reliability, for the distribution of pasty products, such as plasters or mortars, which are used for example in the building industry for plastering walls and floors. With the device concerning to the invention, the plastering operations are carried out with reduced physical fatigue on the part of the operator, with high-quality results and in times which are more than halved in relation to those required using the known art.

The device according to the invention comprises a container for the pasty product to be distributed and from which the product is delivered through a lower tapered nozzle and by means of a compressed-air ejector.

Major characteristics of the invention and the advantages deriving therefrom will appear from the following description of a preferred embodiment of the same, illustrated by way of non-limiting example in the figures of the single attached plate of drawing, in which:

- Fig. 1 is an elevational side view of the device with parts in section,
- Fig. 2 illustrates the device in plan view,
- Fig. 3 illustrates a modified embodiment of the delivery nozzle of the device.

With reference to Figures 1 and 2, the device comprises a container 1, for example with a capacity of roughly 4-5 litres, open at the top, and provided sidewise with a handle 2. The container 1 is formed at its bottom with a conical extension 101, the axis of which is for example inclined at roughly 120° with respect to the vertical axis of the container 1. The extension 101 ends in a nozzle 3 of the desired width. In the remainder of the description, the conical extension 101 will be referred to using the simplified term "cone".

In the example illustrated in the drawings, the container 1 has an essentially round upper mouth 201 and ends at the bottom in an essentially elliptical shape 301, to which the cone 101 is connected. The mouth 201 of the container 1 is inclined, with the top part located at the portion diametrically opposed to the handle 2 to avoid leaks of product from the container during the plastering of horizontal surfaces, for which the device requires a relative forward inclination.

The operator controls the device by holding it with one hand by the cone 101 and with the other hand by the handle 2, on which a valve means 4 is mounted, connected by means of a flexible pipe 5 to a source of compressed air, for example to a compressor. The valve means 4 can be opened and closed by means of a control 104 which is connected to a metal pipe 6 of suitable section which is orientated downwards and, with a small S-shaped bend 106, enters the cone 101 laterally through a hole 7 and an associated lateral sealing plug 8.

The end part of the pipe 6 which is inside the cone 101 forms an ejection nozzle 206 which is orientated towards the nozzle 3, at a suitable distance D from it, and which is essentially on the axis of the cone 101.

Purely by way of non-limiting example, it emerges that good results have been achieved with a device dimensioned as follows:

Height of the container 1 roughly 26 cm. Width of the mouth 201 roughly 15 cm. Size of the base 301 roughly 15x10 cm. Average length of the cone 101 roughly 20 cm. Width of the nozzle 3 roughly 2 cm. Distance D roughly 5-6 cm. Internal diameter of the pipe 6 roughly 4 mm. Pressure of air fed to the valve means 4 preferably not less than 2 atm., for example roughly of the order of 3-5 atm.

The device designed in this way functions in the following manner. The pasty product which is admitted into the container 1-101 has a density such that it uniformly fills the volume employed. By acting on the control 104, the valve means 4 opens and a jet of air emerges from the nozzle 206 of the pipe 6, which finds least resistance in the direction of the nozzle 3 and which therefore pushes the product in front to emerge from said nozzle. If the jet of air is continuous, the flow of the pasty product which emerges from the nozzle 3 is also continuous, as the product upstream of the nozzle 206 flows continuously downwards on account of its own weight and especially as a result of the cavitation created by the product itself which emerges from the nozzle 3. The operator will act to position and slide the nozzle 3 of the device in the channels of the pavement or of the wall to be plastered and the same operator will periodically act to resupply the container 1 with product.

It is also possible for the device to be equipped with a shoulder strap (not shown) to avoid the weight of the assembly bearing completely on the arms of the operator, in particular during wall plastering operations. The same device can furthermore, during operations to plaster horizontal surfaces, be mounted via suitable articulations on a small trolley or on a slide which rest and slide on the pavement to be plastered.

For the delivery of a flow of product with a smaller section than that which emerges from the nozzle 3, particularly for the plastering of gaps in pavements, there is the possibility of introducing onto the end part of the cone 101 a spout 9 which ends at the nozzle 10 of the desired section, which is equipped with a lug 11 capable of being fixed with a screw or other means to a corresponding lug 12 which is integral with the cone itself. Since the nozzle 10 is narrower than that 3 and is further away from the ejection nozzle 206 and since the thrust of the air delivered by this nozzle would no longer be capable of ensuring the correct delivery of the product from said nozzle, there is the possibility of removing the pipe 6 from the valve means 4, of pulling it out of the plug 8 and of replacing it with another pipe of appropriate dimensions (in both length and section), in which the ejection nozzle 13 is located in the position necessary to ensure the correct delivery of product from the new

nozzle 10.

The fact that the pipes for supplying the compressed air (6) can be removed means that the device can be thoroughly cleaned after every use.

Figure 3 illustrates an alternative embodiment according to which the cone 101 ends, immediately upstream of the nozzle 206 of the pipe 6, with a flange 14 to which it is possible to fix a complementary flange 15 of a suitable spout 16, these flanges being arranged for removable mutual joining, for example with a bayonet connection, so that the same spout 16 can be replaced with other spouts having a nozzle 17 with a suitable section depending on the particular application and so as to allow easy cleaning of said nozzle each time the device is used.

Claims

1. Device for the distribution of pasty products, such as mortars and plasters, particularly for building works, characterized in that it comprises:

- a container (1) provided with one upper opening (201) and equipped at the bottom with an oblique extension cone (101) which ends in a nozzle (3) for the delivery of the product;
- at least one handle (2) on said container to support it and guide it during use;
- an ejection nozzle (206) located axially inside said cone (101), orientated in the direction of the discharge nozzle (3) of the device, positioned at a suitable distance from this nozzle and connected to a pipe (6) which is in turn connected to a source for delivery of air at a suitable pressure, through a valve means (4) arranged, so as to be actuated by the operator, the whole being provided to ensure that the jet of compressed air delivered on command from said nozzle encounters the least resistance to emerging from the delivery nozzle of the device, bringing about the emergence from this of a continuous flow of product while, through the effect of the cavitation created by said flow and of gravity, other product is drawn from the container.

2. Device according to Claim 1, in which the container (1) has an essentially round upper mouth (201) and ends at the bottom in an elliptical mouth (301) which is orientated with its larger dimension in the direction of the length of the device and to which the cone (101) is connected, which ends in the tapered nozzle (3) for delivery of the product, while the handle (2) of the same device is located in the intermediate and rear part of the container, opposite said cone.

3. Device according to Claim 1, in which the axis of the cone (101) forms an angle of roughly 120° in

relation to the axis of the container (1).

4. Device according to Claim 1, in which the container (1) has a height of roughly 26 cm, a width greater than roughly 15 cm, has an ellipsoidal lower shape of roughly 15x10 cm and ends in a cone (101) with an average length of roughly 20 cm equipped with a nozzle (3) with a width of roughly 2 cm, provision being made for the ejector (206) to have an internal diameter of roughly 4 mm, to be supplied with a pressure of the order of 2-5 atm. and to be roughly 5-6 cm from said nozzle (3).

5. Device according to Claim 1, in which the upper nozzle (201) of the container (1) has an inclined outline, with the top part diametrically opposed to the handle (2), so as to avoid said product overflowing from the container when the device is used with a slight forward inclination, particularly during the plastering of horizontal surfaces.

6. Device according to the preceding claims, in which the valve means (4) which shuts off the compressed air which, through said pipe (6), emerges from the ejection nozzle (206), is located on the handle (2) of said device and bears a coupling for connection to a flexible pipe (5) for connection to the source of compressed air.

7. Device according to the preceding claims, in which the ejection nozzle (206) constitutes the end part of a rigid pipe (6), for example of a small metal tube, which enters the cone (101) of the device via an S-bend (106) through a lateral hole (7) and an associated sealing plug (8) and which is removably connected by its other end to the valve means (4) mounted on the handle (2).

8. Device according to the preceding claims, in which means are provided for varying the section of the nozzle (3) for discharge of the pasty product from said device, for the purpose of adapting it to the various requirements of use of said device.

9. Device according to Claim 8, characterized in that it is provided with at least one auxiliary spout (9) with a narrow delivery nozzle (10), which can be introduced onto the nozzle of the base cone (101) of the container and which, with an endpiece (11) of its own and with screws or other means, is fixed to a corresponding endpiece (12) of said cone, the device also being equipped with an auxiliary pipe for air supply, of suitable length and section, which replaces the existing one (6) in such a manner that its own ejection nozzle (13) is in the correct position to ensure the emergence of the product from said spout.

10. Device according to Claim 8, characterized in that

the base cone (101) of the container ends, upstream of the nozzle (206) for delivery of the compressed air, with a flange (14) to which the flange (15) of a spout (16) is fixed by suitable removable joining means, for example with a bayonet connection, it being possible for this spout to be replaced with other spouts with which the device is equipped and which have a nozzle (17) with a suitable diameter depending on the particular application and/or can be removed whenever said nozzle (206) needs to be cleaned.

11. Device according to Claim 1, characterized in that it may be equipped with a shoulder strap to facilitate use during wall plastering operations.
12. Device according to Claim 1, characterized in that it is mounted by means of articulations on a small trolley or on a slide which rest on the ground and which facilitate the use of said device by the operator, in particular during pavement plastering operations .

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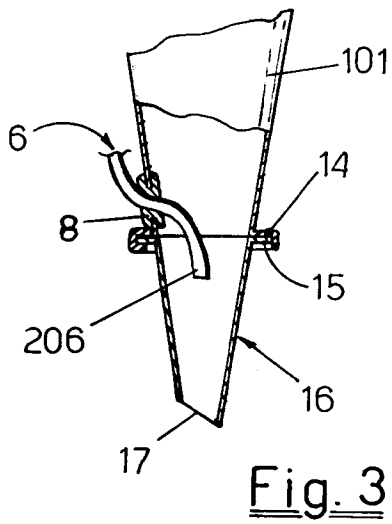
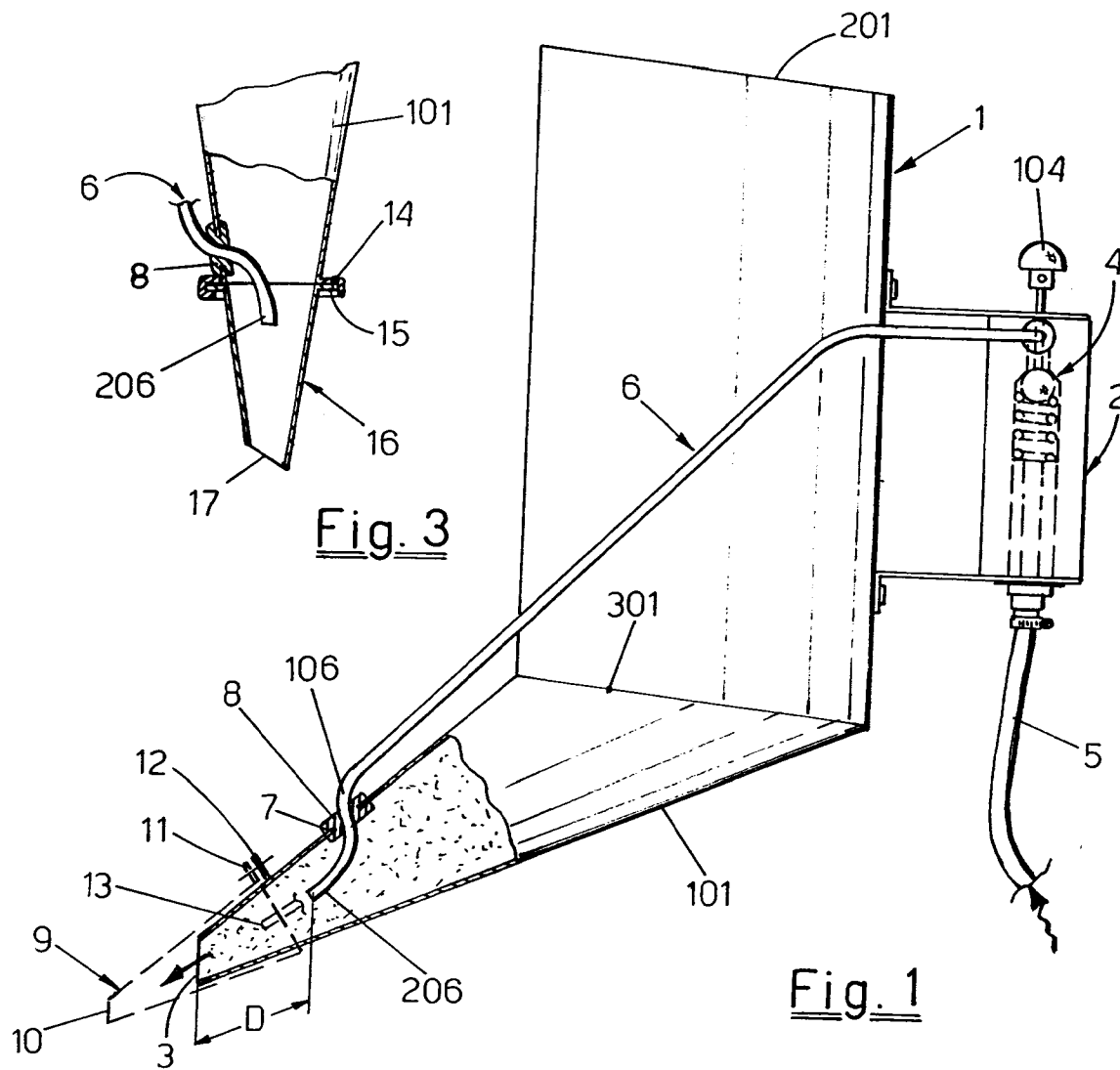
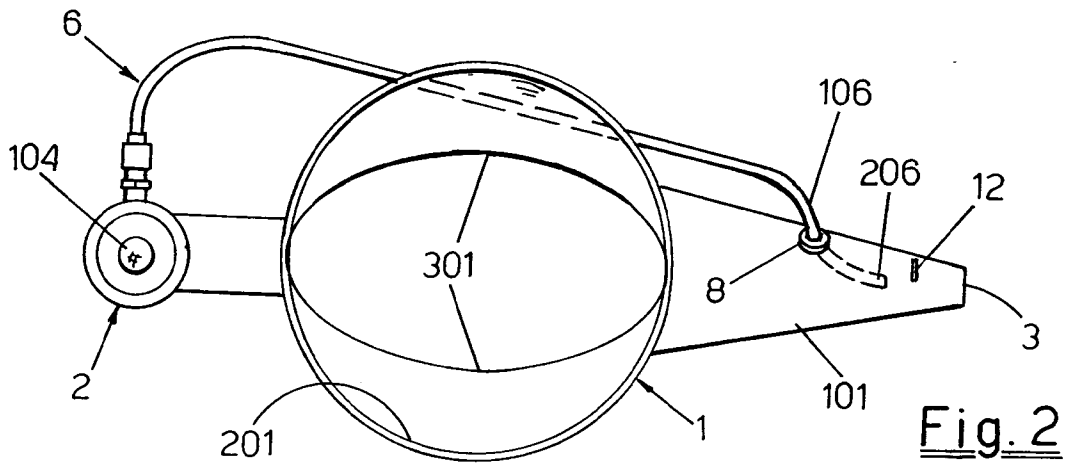
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EUROPEAN SEARCH REPORT

Application Number
EP 96 10 7740

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	FR-A-1 114 096 (NOLA) * page 1, left-hand column, line 33 - page 2, left-hand column, line 32; figures 1,2 *	1	B05B7/14 E04F21/12 B28C7/16
Y		11,12	
A		2	
Y	--- US-A-2 391 048 (VOSE) * page 1, right-hand column, line 4 - page 2, right-hand column, line 25; figures 1-4 *	11	
A		1	
Y	--- FR-A-1 203 437 (MONTCOCOL) * page 1, right-hand column, line 3 - page 2, right-hand column, line 26; figures 1-3 *	12	
A		1	
A	--- DE-C-811 037 (THE "CEMENT-GUN" COMPANY LTD.) * page 2, line 9 - line 75; figures 1,2 *	1,3	TECHNICAL FIELDS SEARCHED (Int.Cl.6)
A	--- DE-C-894 761 (BURBACH) * page 2, line 66 - line 112; figures 1,2 *	1,3	B05B E04F B28C
A	--- US-A-1 566 325 (HANSEN) * page 1, line 54 - line 99; figures 1-3 * -----	1	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 9 September 1996	Examiner Ayiter, J
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