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

Vorrichtung zur Verteilung von pastösen Produkten, wie Putz oder Mörtel, insbesondere für Bauwerke

Dispositif pour la distribution de produits pâteux, tels que enduits ou mortiers, notamment pour travaux de construction

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(56) References cited:
DE-C- 811 037 **DE-C- 894 761**
FR-A- 1 114 096 **FR-A- 1 203 437**
US-A- 1 566 325 **US-A- 2 391 048**

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Description

[0001] 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.

[0002] From FR-A-1 114 096 there is known a device for the distribution of pasty products, such as mortars or plasters, particularly for building works, comprising a container provided with one upper opening and equipped at the bottom with an oblique extension cone which ends in a nozzle for the delivery of the product, and with an ejection nozzle located axially inside said cone and orientated in the direction of the discharge nozzle of the device and connected to a pipe which in turn is connected to a source for delivery of air at suitable pressure.

[0003] However, this device is not adapted for the distribution of comparatively dense materials, nor it is adapted to be portable.

[0004] From DE-A-894 761 is also known a device for the distribution of pasty products. However, this device is not adapted for the delivery of continuous flow of product for the plastering of channels in pavements and walls.

[0005] The device according to the invention aims to obviate to the drawbacks of the said prior art devices, by providing 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, as defined in claim 1.

[0006] 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.

[0007] 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 sideways 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".

[0008] 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.

[0009] 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.

[0010] 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.

[0011] Purely by way of non-limiting example, it emerges that good results have been achieved with a device dimensioned as follows:

[0012] 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.

[0013] 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.

[0014] 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.

[0015] 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.

[0016] 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.

[0017] 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, comprising:
 - a container (1) provided with one upper opening (201) and equipped at the bottom with an extension cone (101) ending in a tapered discharge nozzle (3) for the delivery of the product;
 - 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 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 ejection nozzle (206) encounters the least resistance to emerging from the delivery nozzle (3) 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, additional product is drawn from the container (1), **characterized in that** 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 axis of the cone (101) and to which the cone (101) is connected, the axis of said cone being inclined with respect to the vertical axis of the container while the handle (2) of the same device is located in the intermediate and rear part of the container, opposite said cone.
2. 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).
3. 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).
4. Device according to Claim 1, in which the upper mouth (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.
5. 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.
6. 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

7. 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. 5
8. Device according to Claim 7, **characterized in that** an auxiliary spout (9) with a narrow delivery nozzle (10), and a lug (11) is introduced onto the nozzle of the cone (101) of the container (1) and is fixed to a corresponding lug (12) of said cone (101) with screws or other means 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 15
9. Device according to Claim 7, **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 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. 20 25
10. Device according to Claim 1, **characterized in that** it is equipped with a shoulder strap to facilitate use during wall plastering operations. 30
11. 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. 35 40

Patentansprüche

1. Vorrichtung zur Verteilung pastöser Produkte wie Mörtel oder Putz, insbesondere für Bauwerke, die folgende Elemente aufweist: 45
- einen Behälter (1), der mit einer oberen Öffnung (201) versehen ist und an der Unterseite einen Verlängerungskegel (101) besitzt, welcher in einer kegelförmigen Abgabedüse (3) für die Abgabe des Produkts endet; 50
 - einen Griff (2) am Behälter, um diesen während des Gebrauchs zu stützen und zu führen; 55
 - eine Ausströmdüse (206), die sich axial im Inneren des Kegels (101) befindet, in Richtung der Düse (3) der Vorrichtung ausgerichtet ist,

in geeignetem Abstand von dieser Düse positioniert ist und mit einem Rohr (6) verbunden ist, das wiederum mit einer Quelle für die Zufuhr von Luft mit geeignetem Druck verbunden ist, und zwar durch ein Ventilmittel (4), das durch die Bedienperson zu betätigen ist, wobei die ganze Anordnung so vorgesehen ist, dass gewährleistet wird, dass der auf Anforderung aus der Ausströmdüse (206) abgegebene Druckluftstrahl den geringsten Widerstand erfährt, wenn er aus der Abgabedüse (3) der Vorrichtung austritt, was das kontinuierliche Ausströmen des Produkts aus dieser mit sich bringt, wobei aufgrund des durch die Strömung und die Schwerkraft erzeugten Hohlzugs noch weiteres Produkt aus dem Behälter (1) gezogen wird, **dadurch gekennzeichnet**, dass der Behälter (1) eine im Wesentlichen runde obere Öffnung (201) aufweist und an der Unterseite in einer elliptischen Öffnung (301) endet, die mit ihrer größeren Abmessung in Richtung der Achse des Kegels (101) ausgerichtet ist, und mit der der Kegel (101) verbunden ist, wobei die Achse des Kegels zur vertikalen Achse des Behälters geneigt ist, während der Griff (2) der gleichen Vorrichtung sich im mittleren und hinteren Bereich des Behälters, dem Kegel gegenüberliegend, befindet.

2. Vorrichtung nach Anspruch 1, bei der die Achse des Kegels (101) mit der Achse des Behälters (1) einen Winkel von etwa 120° bildet.
3. Vorrichtung nach Anspruch 1, bei der der Behälter (1) eine Höhe von etwa 26 cm, eine Breite von mehr als etwa 15 cm und eine ellipsoidische untere Form von etwa 15 x 10 cm besitzt und in einem Kegel (101) mit einer durchschnittlichen Länge von etwa 20 cm endet, welcher mit einer Düse (3) mit einer Breite von etwa 2 cm ausgestattet ist, wobei die Ausströmdüse (206) so vorgesehen ist, dass sie einen Innendurchmesser von etwa 4 mm besitzt und wobei sie mit einem Druck in der Größenordnung von 2-5 bar beaufschlagt wird und etwa 5-6 cm von der Düse (3) entfernt vorliegt.
4. Vorrichtung nach Anspruch 1, bei der die obere Öffnung (201) des Behälters (1) eine geneigte Kontur besitzt, wobei der obere Bereich dem Griff (2) diametral gegenüberliegt, so dass vermieden wird, dass das Produkt aus dem Behälter fließt, wenn die Vorrichtung mit einer leichten Neigung nach vorn verwendet wird, insbesondere während des Verputzens von horizontalen Flächen.
5. Vorrichtung nach den vorhergehenden Ansprüchen, bei der das Ventilmittel (4), das die Druckluft absperrt, die durch das Rohr (6) aus der Ausström-

düse (206) austritt, sich an dem Griff (2) der Vorrichtung befindet und ein Verbindungselement zur Verbindung mit einem flexiblen Rohr (5) und zur Verbindung desselben mit der Druckluftquelle aufweist.

6. Vorrichtung nach den vorhergehenden Ansprüchen, bei der die Ausströmdüse (206) den Endbereich eines starren Rohrs (6) darstellt, beispielsweise eines kleinen Metallrohrs, das über eine S-förmige Biegung in den Kegel (101) der Vorrichtung eintritt. 10
7. Vorrichtung nach den vorhergehenden Ansprüchen, bei der Mittel vorgesehen sind, um den Querschnitt der Düse (3) zur Abgabe des pastösen Produkts aus der Vorrichtung zu ändern und diese damit den verschiedenen Anforderungen zur Verwendung der Vorrichtung anzupassen. 15
8. Vorrichtung nach Anspruch 7, **dadurch gekennzeichnet**, dass eine Hilfstülle (9) mit einer schmalen Abgabedüse (10) und einer Nase (11) auf die Düse des Kegels (101) des Behälters (1) aufgebracht und durch Schrauben oder andere Mittel an einer entsprechenden Nase (12) des Kegels (101) befestigt ist, wobei die Vorrichtung auch mit einem Hilfsrohr für die Luftzufuhr mit geeigneter Länge und geeignetem Querschnitt versehen ist, das das existierende Rohr (6) so ersetzt, dass seine eigene 20
Ausströmdüse (13) in der korrekten Position liegt, um das Austreten des Produkts aus der Tülle zu gewährleisten. 25
9. Vorrichtung nach Anspruch 7, **dadurch gekennzeichnet**, dass der Basiskegel (101) des Behälters stromaufwärts der Düse (206) für die Zufuhr der Druckluft mit einem Flansch (14) endet, an dem der Flansch (15) einer Tülle (16) durch geeignete lösbare Verbindungsmittel befestigt ist, beispielsweise mittels eines Bajonettverschlusses, so dass diese Tülle durch andere Tüllen ersetzt werden kann, die eine Düse (17) mit vom Anwendungsgebiet abhängigem Durchmesser besitzen, und/oder entfernt werden kann, wenn die Düse (206) gereinigt werden muss. 30
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10. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet**, dass sie mit einem Schultergurt ausgestattet ist, um die Anwendung beim Verputzen von Wänden zu erleichtern. 45
11. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet**, dass sie über Gelenkverbindungen auf einem kleinen Rollwagen oder einem Schlitten befestigt wird, die auf dem Boden stehen und die Anwendung der Vorrichtung durch die Bedienperson insbesondere während des Verputzens von Böden 50
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erleichtern.

Revendications

1. Dispositif destiné à distribuer des produits en pâte, tels que des mortiers et enduits, en particulier pour des travaux de construction, comprenant :

un récipient (1) comportant un orifice supérieur (201) et muni en partie inférieure d'un cône de prolongement (101) se terminant par une buse d'éjection conique 3 délivrant le produit ;
une poignée (2) sur ledit récipient afin de le supporter et de le guider au cours de l'utilisation ;
une buse d'éjection (206) disposée axialement à l'intérieur dudit cône (101), orientée dans la direction de la buse (3) du dispositif, positionnée à une distance appropriée par rapport à cette buse et reliée à un tuyau (6) lui-même relié à une source délivrant de l'air à une pression appropriée, par l'intermédiaire d'un moyen formant vanne (4) agencé de manière à être activé par l'opérateur, l'ensemble étant agencé de manière que le jet d'air comprimé délivré à la commande à partir de ladite buse d'éjection (206) rencontre une moindre résistance pour sortir par la buse (3) du dispositif, entraînant l'éjection d'un flux continu de produit, alors que, par l'intermédiaire de l'effet de cavitation créé par ledit écoulement et de la gravité, du produit frais est extrait du récipient (1), **caractérisé en ce que** le récipient (1) présente un orifice supérieur sensiblement rond (201) et se termine en partie inférieure par un orifice elliptique (301) dont la dimension la plus importante est dans le sens de l'axe du cône (101) et sur lequel le cône (101) est raccordé, l'axe dudit cône étant incliné par rapport à l'axe vertical du récipient, cependant que la poignée (2) du dispositif est disposée dans la partie intermédiaire et arrière du récipient, à l'opposé dudit cône.

2. Dispositif selon la revendication 1, dans lequel l'axe du cône (101) forme un angle de 120° environ par rapport à l'axe du récipient (1). 45
3. Dispositif selon la revendication 1, dans lequel le récipient (1) présente une hauteur de 26 cm environ, une largeur supérieure à 15 cm environ, présente une forme en partie inférieure ellipsoïdale de 15x10 cm environ et se termine par un cône (101) avec une longueur moyenne de 20 cm environ équipée d'une buse (3) d'une largeur de 2 cm environ, la buse d'injection (206) présentant un diamètre interne de 4 mm environ de manière à être alimentée par une pression de l'ordre de 2 à 5 bars et disposée 50
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à 5 à 6 cm environ de ladite buse (3).

4. Dispositif selon la revendication 1, dans lequel l'orifice supérieur (201) du récipient (1) présente un profil incliné, la partie supérieure étant diamétralement opposée à la poignée (2) de manière à éviter le débordement dudit produit à partir du récipient lorsque le dispositif est utilisé avec une légère inclinaison vers l'avant, en particulier durant l'enduction de surfaces horizontales.

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5. Dispositif selon les revendications précédentes, dans lequel le moyen formant vanne (4) qui coupe l'air comprimé qui, à travers ledit tuyau (6) sort par la buse d'éjection (206), est disposé sur la poignée (2) dudit dispositif et porte un raccord de raccordement à un tuyau flexible (5) pour assurer la liaison avec la source d'air comprimé.

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6. Dispositif selon les revendications précédentes, dans lequel la buse d'éjection (206) constitue la partie d'extrémité d'un tuyau rigide (6), par exemple d'un petit tube métallique, qui rentre dans le cône (101) du dispositif par l'intermédiaire d'un coude en S.

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7. Dispositif selon les revendications précédentes, dans lequel des moyens sont prévus pour faire varier la section de la buse (3) d'éjection du produit en pâte hors dudit dispositif, à des fins d'adaptation à différentes spécifications d'utilisation dudit dispositif.

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8. Dispositif selon la revendication 7, **caractérisé en ce qu'un** bec auxiliaire (9) à orifice de sortie étroit (10) et patte (11) est monté sur l'extrémité du cône (101) du récipient (1) et est fixé sur une patte (12) correspondante dudit cône (101) avec des vis ou d'autres moyens, ledit dispositif étant également muni d'un tuyau auxiliaire pour l'alimentation en air, de longueur et de section appropriées, en remplacement du tuyau (6) existant de manière que sa propre buse d'éjection (13) soit en position correcte pour assurer la sortie du produit hors dudit bec.

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9. Dispositif selon la revendication 7, **caractérisé en ce que** le cône de base (101) du récipient se termine en amont de la buse (206) de fourniture de l'air comprimé, par une collerette (14) sur laquelle la collerette (15) d'un bec (16) est fixée par un moyen de liaison amovible approprié, par exemple, une liaison à baïonnette, en sorte de remplacer ce bec par d'autres becs qui présentent un orifice de sortie (17) avec un diamètre approprié à l'application particulière et/ou de le retirer dans le cas où ladite buse (206) doit être nettoyée.

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10. Dispositif selon la revendication 1, **caractérisé en**

ce qu'il est muni d'une bandoulière pour faciliter l'utilisation au cours d'opérations d'enduction de parois.

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11. Dispositif selon la revendication 1, **caractérisé en ce qu'il** est monté au moyen d'articulation sur un petit chariot ou sur un patin qui repose sur le sol et qui facilite l'utilisation dudit dispositif par l'opérateur, en particulier au cours d'opérations d'enduction de carrelage.

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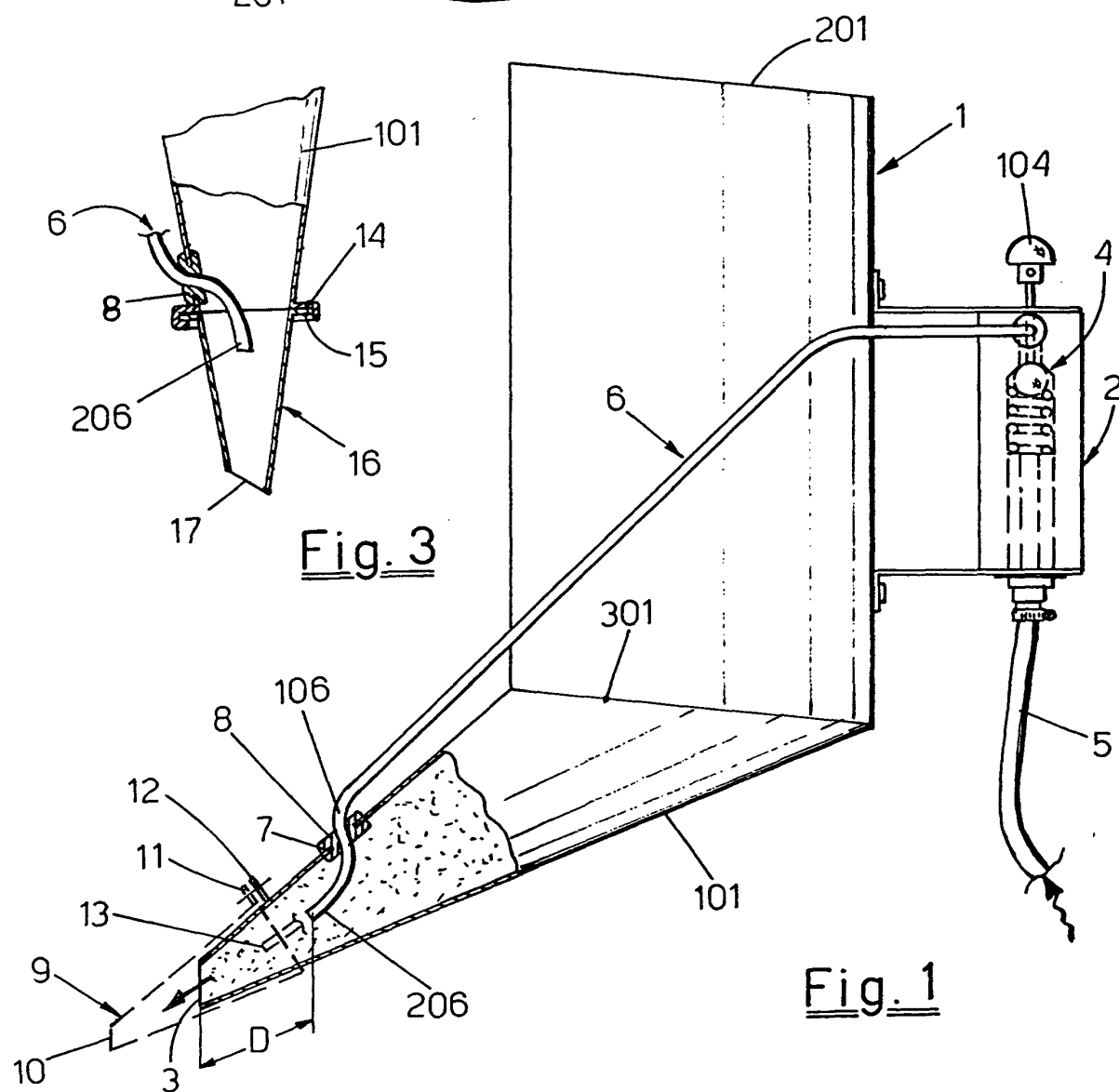
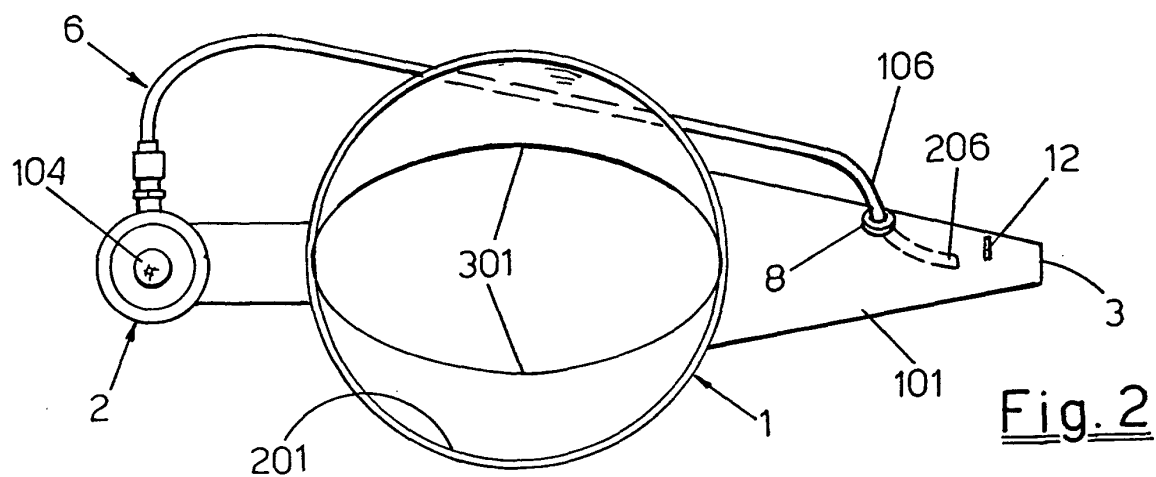


Fig. 3