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(54) **A mobile spray apparatus**

Tragbare Sprühvorrichtung

Appareil de pulvérisation mobile

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Description

[0001] This invention relates generally to a mobile apparatus for spraying a fluid. More specifically, this invention relates to a mobile apparatus for spraying a release agent used in the baking or allied industries.

[0002] A release agent is often required in the baking industry to assist with the undamaged removal of a baking product, e.g. bread, cakes etc., from the baking receptacle that has been used in the baking process. Typically, the release agent is in the form of an oil or oil-in-water emulsion spray.

[0003] Conventionally, there are two types of spray equipment available for the application of a release agent: air-mix systems and airless systems.

Air-mix systems

[0004] Here, the release agent and compressed air are mixed together and forced under pressure through the nozzle of a spray gun.

Airless systems

[0005] A conventional airless system comprises a pressurised barrel or keg containing the release agent. Typically, the release agent will be applied to baking receptacles via a dosing spray gun that is interconnected with the barrel or keg.

[0006] In the known airless systems a problem arises in that there is a relatively short [of the order of minutes] optimum spraying time before the pressure in the barrel or keg falls below a workable level. At this point it is necessary to restore the pressure level within the barrel or keg before spraying can be resumed.

[0007] A further disadvantage with prior art systems is that there is always a residue in the barrel or keg that cannot be dispensed. Also, a problem often arises due to compressor air coming into contact with the release agent within the barrel itself; in this case the barrel will need to be returned to the supplier.

[0008] Another disadvantage with keg-based systems is the weight of the keg itself. Typically, a full keg of liquid release agent will weigh around 45kg. This is delivered to an end-user in a fully laden condition, and must be returned for re-filling after use.

[0009] EP0370268 discloses an arrangement for coating a release agent to a surface.

[0010] Mobile fluid spray apparatuses are also known from US3977602, DE2732049, NL1028555C or US4358026.

[0011] The present invention arose in attempts to address some or all of the aforementioned problems and disadvantages of the prior art. According to the present invention there is provided a mobile fluid spray apparatus and a method of applying a liquid release agent to baking receptacles as defined in the appended claims.

[0012] According to an aspect of the present invention

there is provided a mobile fluid spray apparatus comprising: a wheeled housing; a tank disposed within the housing adapted to receive a pressurised gas; a pressure regulator device connected to an outlet of said tank for regulating the output flow of the pressurised gas; a compartment disposed within the housing for removably receiving a fluid container, said fluid container being connectable to the tank outlet via the pressure regulator device; and a hand-held spray gun connectable to said fluid container for the controlled release of fluid from the fluid container when said fluid container is connected to said tank outlet.

[0013] According to an aspect of the present invention there is provided a mobile fluid spray apparatus comprising: a wheeled housing; a tank disposed within the housing adapted to receive a pressurised gas; a pressure regulator device connected to an outlet of said tank for regulating the output flow of the pressurised gas; a removable fluid container connected to the tank outlet via the pressure regulator device; and a hand-held spray gun connected to said fluid container for the controlled release of fluid from the fluid container.

[0014] The fluid is a liquid release agent of the type used in the baking industry.

[0015] The pressurised gas is air. Preferably, the tank is adapted to contain an air pressure of between 5 to 10 bar. More preferably the tank is adapted to contain an air pressure of 8 bar.

[0016] The tank includes an inlet valve for receiving pressurised air from an external supply.

[0017] Preferably, the fluid container comprises an outer body fabricated from polyethylene terephthalate (PET). And the fluid container comprises a flexible inner bladder which expands when filled with the fluid.

[0018] Preferably the outer body is substantially spherical.

[0019] An embodiment of the present invention will now be described, by way of example only, and with reference to the accompanying schematic drawings, in which:

Figure 1 shows a sectional view of the mobile fluid spray apparatus of the present invention;

Figure 2 shows a perspective view of the mobile fluid spray apparatus of Figure 1; and

Figure 3 shows a detailed view of the hose and spray gun sub-assembly of the mobile fluid spray apparatus of the present invention.

[0020] Referring to the Figures, a mobile fluid spray apparatus 1 comprises a wheeled housing 2. The wheeled housing 2 comprises a lower chamber 3, and upper chamber 4, a tubular frame 5, and wheels 6 fixed to both the lower chamber 3 and the tubular frame 5.

[0021] The upper chamber 4 and lower chamber 3 are substantially cylindrical in shape, and the upper chamber

4 includes a sealed top plate 7. Although not shown, the upper chamber 4 also includes access means for enabling installation and removal of a fluid container 20.

[0022] A hose and spray gun sub-assembly 8 (see Figure 3) includes a dispensing head 9 which is locked in place on the sealed top plate 7, a spray gun 10 interconnected to the dispensing head via hose 11. Hose 11 is in fluid communication with an inner bladder 21 of the fluid container 20. The sub-assembly 8 also includes hose 12 (shown only partially in Figure 3), that interconnects a high-pressure tank 30 with a substantially spherical PET bottle 22 via the tubular frame 5.

[0023] The high-pressure tank 30 is pre-filled with pressurised air via an inlet valve 31, and the outlet pressure to the spherical PET bottle 22 is controlled by a pressure regulator 32. A pressure gauge 33 allows a user to monitor both the tank pressure and the air pressure reaching the fluid container 20.

[0024] In use, the high-pressure tank is filled with pressurised air to substantially 8 bar. A fluid container 20, which has been pre-filled with liquid baking release agent at a remote site, is inserted into the upper chamber 4 through a sealable access panel (not shown). In a full state, the inner bladder 21 is expanded to leave a small air gap 23 between it and the spherical PET bottle 22.

[0025] Relatively low pressure air (3.8 bar) is released into the gap 23 via pressure regulator 32, tubular frame 5, and hose 12. Once the spray gun 10 is actuated, the pressure on the inner bladder 21 forces the liquid baking release agent through an outlet 24, along the hose 11 and out of the nozzle 13 in the form of a spray. The fineness of this spray can be adjusted via the nozzle 13.

[0026] Advantageously, the capacity of the tank 30 and the fact that it is pre-filled with high-pressure air allows for much longer spraying time (typically 1hr) before there is a significant pressure drop. Furthermore, because no air compressor is used during spraying operations there are no umbilical attachments to the apparatus, nor is there any likelihood that compressor air will come into contact with the liquid release agent.

[0027] Another advantage of the present invention is that since the bladder is flexible and can be 'squeezed', the entire product contained therein is dispensed, and there is no waste residue.

[0028] Since the apparatus of the present invention does not require a fixed-point compressed air supply, and since it also does not need to be connected to an electricity mains supply, it is totally mobile and is free to be positioned in any desired position about the bakery or working environment.

[0029] Also, the delivery weight of a full fluid container according to the present invention is typically 20kg. Since the combined weight of an empty bladder and bottle is only around 1kg, the majority of the weight of the delivered container from the supplier represents actual product, and the weight attributable to the container itself is minimal. Furthermore, after use, the empty container (bladder + bottle) can be crushed and recycled in any

convenient manner: there is no requirement to return the fluid container since they are not intended to be re-filled, which negates the requirement of an end-user to store empty containers for collection.

Claims

1. A mobile fluid spray apparatus (1) comprising:

a first fluid container (20) and
a hand-held spray gun (10) connected to said fluid container for the controlled release of fluid from the fluid container,

the fluid being a liquid release agent for application to baking receptacles for the production of baked food products;

characterised in that

the fluid container comprises an outer body (22) enclosing an inner flexible bladder (21), the fluid being stored within the bladder;

and the apparatus further comprises:

a wheeled housing (2),
a tank (30) containing compressed air, and
a pressure regulator (32) connected to an outlet of the tank;

the tank having an inlet valve (31) for filling the tank with compressed air from an external supply;
the first fluid container (20) being connected to the outlet of the tank via the pressure regulator, the pressure regulator being arranged, when connected to the first fluid container, to release compressed air from the tank at a reduced pressure into a gap (23) between the outer body (22) and the inner flexible bladder (21);
and a plurality of said fluid containers (20) are provided,
the first fluid container (20) being removable and replaceable by a further said fluid container after it is emptied of fluid,
and each fluid container is adapted to be crushed when empty.

2. A mobile fluid spray apparatus according to claim 1, wherein the outer body is fabricated from polyethylene terephthalate (PET).

3. A mobile fluid spray apparatus according to claim 2, wherein the outer body is a substantially spherical bottle.

4. A mobile fluid spray apparatus as claimed in any preceding claim, wherein the tank is adapted to contain an air pressure of between 5 to 10 bar.

5. A mobile fluid spray apparatus as claimed in claim 5, wherein the tank is adapted to contain an air pressure of 8 bar.

6. A method of applying a fluid to baking receptacles for the production of baked food products, the fluid being a liquid release agent, comprising:

providing a mobile fluid spray apparatus (1) including a wheeled housing (2), a hand-held spray gun (10), and a tank (30) containing compressed air;
connecting a pressure regulator (32) to an outlet of the tank;

filling the tank via an inlet valve (31) with compressed air from an external supply;

providing a plurality of fluid containers (20), each fluid container (20) comprising an outer body (22) enclosing an inner flexible bladder (21);
receiving and storing the fluid in the inner flexible bladder of each fluid container (20);

connecting a first one of said fluid containers (20) to the hand-held spray gun (10) and via the pressure regulator (32) to the outlet of the tank;
releasing compressed air via the pressure regulator from the tank at a reduced pressure into a gap (23) between the outer body (22) and the inner flexible bladder (21);

actuating the hand-held spray gun (10) to force the fluid, by the reduced pressure acting on the inner flexible bladder (21), out of a nozzle (13) of the hand-held spray gun (10) in the form of a spray until the inner flexible bladder (21) is emptied of fluid; and then

removing the first one of the fluid containers (20) and replacing it with another one of the fluid containers.

7. A method according to claim 6, including crushing the first one of the fluid containers (20) after it is emptied of fluid.

8. A method according to claim 7, wherein the first one of the fluid containers (20) is recycled after crushing.

Patentansprüche

1. Tragbare Flüssigkeitssprühvorrichtung (1), umfassend:

einen ersten Fluidbehälter (20) und eine Handsprühpistole (10), die mit dem Flüssigkeitsbehälter verbunden ist, zur gesteuerten Abgabe von Flüssigkeit aus dem Flüssigkeitsbehälter, wobei die Flüssigkeit ein flüssiges Trennmittel zum Aufbringen auf Backgefäße für die Produktion von gebackenen Nahrungsmit-

teln ist;

dadurch gekennzeichnet, dass

der Flüssigkeitsbehälter einen äußeren Körper (22) umfasst, das eine innere flexible Blase (21) umschließt, wobei die Flüssigkeit in der Blase gelagert wird;

und die Vorrichtung weiterhin Folgendes umfasst:

ein Rollgehäuse (2),
einen Tank (30), der Druckluft enthält, und einen Druckregler (32), der mit einem Ablass des Tanks verbunden ist;

wobei der Tank ein Einlassventil (31) zum Füllen des Tanks mit Druckluft von einer externen Zufuhr aufweist; der erste Flüssigkeitsbehälter (20) mittels des Druckreglers mit dem Ablass des Tanks verbunden ist, wobei der Druckregler dazu eingerichtet ist, wenn er mit dem ersten Flüssigkeitsbehälter verbunden ist, Druckluft aus dem Tank mit einem verringerten Druck in einen Spalt (23) zwischen dem äußeren Gehäuse (22) und der inneren flexiblen Blase (21) abzugeben;

und mehrere der Flüssigkeitsbehälter (20) vorgesehen sind,

wobei der erste Flüssigkeitsbehälter (20) herausnehmbar und durch einen weiteren der Flüssigkeitsbehälter austauschbar ist, nachdem die Flüssigkeit daraus entleert wurde, und jeder Flüssigkeitsbehälter dazu geeignet ist, gequetscht zu werden, wenn er leer ist.

2. Tragbare Flüssigkeitssprühvorrichtung nach Anspruch 1, wobei der äußere Körper aus Polyethylenterephthalat (PET) hergestellt ist.

3. Tragbare Flüssigkeitssprühvorrichtung nach Anspruch 2, wobei der äußere Körper eine im Wesentlichen sphärische Flasche ist.

4. Tragbare Flüssigkeitssprühvorrichtung nach einem vorhergehenden Anspruch, wobei der Tank dazu geeignet ist, einen Luftdruck zwischen 5 und 10 bar zu enthalten.

5. Tragbare Flüssigkeitssprühvorrichtung nach Anspruch 5, wobei der Tank dazu geeignet ist, einen Luftdruck von 8 bar zu enthalten.

6. Verfahren zum Aufbringen einer Flüssigkeit auf Backgefäße für die Produktion von gebackenen Nahrungsmitteln, wobei die Flüssigkeit ein flüssiges Trennmittel ist, umfassend:

Bereitstellen einer tragbaren Flüssigkeitssprühvorrichtung (1), die ein Rollgehäuse (2), eine Handsprühpistole (10) und einen Tank (30), der

- Druckluft enthält, beinhaltet;
 Verbinden eines Druckreglers (32) mit einem
 Ablass des Tanks;
 Füllen des Tanks mit Druckluft von einer exter-
 nen Zufuhr mittels eines Einlassventils (31);
 Bereitstellen von mehreren Flüssigkeitsbehäl-
 tern (20), wobei jeder Flüssigkeitsbehälter (20)
 einen äußeren Körper (22) umfasst, der eine in-
 nere flexible Blase (21) umschließt;
 Aufnehmen und Lagern der Flüssigkeit in der
 inneren flexiblen Blase jedes Flüssigkeitsbehäl-
 ters (20);
 Verbinden eines ersten einen der Flüssigkeits-
 behälter (20) mit der Handsprühpistole (10) und
 mittels des Druckreglers (32) mit dem Ablass
 des Tanks;
 Abgeben von Druckluft mittels des Druckreglers
 aus dem Tank mit einem verringerten Druck in
 einen Spalt (23) zwischen dem äußeren Gehäu-
 se (22) und der inneren flexiblen Blase (21);
 Betätigen der Handsprühpistole (10), um die
 Flüssigkeit durch den verringerten Druck, der
 auf die innere flexible Blase (21) einwirkt, aus
 einer Düse (13) der Handsprühpistole (10) in der
 Form eines Sprays zu treiben, bis die innere fle-
 xible Blase (21) flüssigkeitsleer ist; und dann
 Herausnehmen des ersten einen der Flüssig-
 keitsbehälter (20) und Austauschen dieses
 durch einen anderen der Flüssigkeitsbehälter.
7. Verfahren nach Anspruch 6, das ein Quetschen des
 ersten einen der Flüssigkeitsbehälter (20) umfasst,
 nachdem die Flüssigkeit daraus entleert wurde.
8. Verfahren nach Anspruch 7, wobei der erste eine
 der Flüssigkeitsbehälter (20) nach dem Quetschen
 recycelt wird.

Revendications

1. Appareil de pulvérisation de fluide mobile (1)
 comportant :
- un premier récipient de fluide (20) et
 un pistolet de pulvérisation à main (10) raccordé
 audit récipient de fluide à des fins de libération
 contrôlée de fluide en provenance du récipient
 de fluide,
- le fluide étant un agent de démoulage liquide destiné
 à des fins d'application sur des contenants de cuis-
 son au four pour la production de produits alimen-
 taires cuits au four ; **caractérisé en ce que**
 le récipient de fluide comporte un corps extérieur
 (22) renfermant une vessie flexible intérieure (21),
 le fluide étant stocké à l'intérieur de la vessie ;
 et l'appareil comporte par ailleurs :

un logement sur roues (2),
 un réservoir (30) qui contient de l'air comprimé,
 et
 un régulateur de pression (32) raccordé au ni-
 veau d'un orifice de sortie du réservoir ;

le réservoir ayant une soupape d'admission (31) ser-
 vant à remplir le réservoir au moyen d'air comprimé
 en provenance d'une alimentation externe ;
 le premier récipient de fluide (20) étant raccordé à
 l'orifice de sortie du réservoir par le biais du régula-
 teur de pression, le régulateur de pression étant
 agencé, quand il est raccordé au premier récipient
 de fluide, pour libérer de l'air comprimé en prove-
 nance du réservoir à une pression réduite dans un
 espace (23) entre le corps extérieur (22) et la vessie
 flexible intérieure (21) ;
 et une pluralité desdits récipients de fluide (20) sont
 prévus,
 le premier récipient de fluide (20) étant en mesure
 d'être retiré et remplacé par un autre dit récipient de
 fluide une fois qu'il a été vidé de son fluide,
 et chaque récipient de fluide est adapté pour être
 écrasé une fois qu'il est vide.

2. Appareil de pulvérisation de fluide mobile selon la
 revendication 1, dans lequel le corps extérieur est
 fabriqué à partir de polyéthylène téréphtalate (PET).
3. Appareil de pulvérisation de fluide mobile selon la
 revendication 2, dans lequel le corps extérieur est
 un cylindre sensiblement sphérique.
4. Appareil de pulvérisation de fluide mobile selon l'une
 quelconque des revendications précédentes, dans
 lequel le réservoir est adapté pour contenir une pres-
 sion d'air entre 5 à 10 bars.
5. Appareil de pulvérisation de fluide mobile selon la
 revendication 5, dans lequel le réservoir est adapté
 pour contenir une pression d'air de 8 bars.
6. Procédé permettant d'appliquer un fluide sur des
 contenants de cuisson au four pour la production de
 produits alimentaires cuits au four, le fluide étant un
 agent de démoulage liquide, comportant les étapes
 consistant à :
- mettre en oeuvre un appareil de pulvérisation
 de fluide mobile (1) comprenant un logement
 sur roues (2), un pistolet de pulvérisation à main
 (10), et un réservoir (30) qui contient de l'air
 comprimé ;
 raccorder un régulateur de pression (32) au ni-
 veau d'un orifice de sortie du réservoir ;
 remplir le réservoir par le biais d'une soupape
 d'admission (31) au moyen d'air comprimé en
 provenance d'une alimentation externe ;

mettre en oeuvre une pluralité de récipients de fluide (20), chaque récipient de fluide (20) comportant un corps extérieur (22) renfermant une vessie flexible intérieure (21) ;
recevoir et stocker le fluide dans la vessie flexible intérieure de chaque récipient de fluide (20) ;
raccorder un premier desdits récipients de fluide (20) au pistolet de pulvérisation à main (10) et par le biais du régulateur de pression (32) à l'orifice de sortie du réservoir ;
libérer de l'air comprimé par le biais du régulateur de pression en provenance du réservoir à une pression réduite dans un espace (23) entre le corps extérieur (22) et la vessie flexible intérieure (21) ;
actionner le pistolet de pulvérisation à main (10) pour forcer le fluide, par la pression réduite agissant sur la vessie flexible intérieure (21), hors d'une buse (13) du pistolet de pulvérisation à main (10) sous la forme d'une pulvérisation jusqu'à ce que la vessie flexible intérieure (21) soit vidée de son fluide ; et puis
retirer le premier des récipients de fluide (20) et le remplacer par un autre des récipients de fluide.

7. Procédé selon la revendication 6, comprenant l'étape consistant à écraser le premier des récipients de fluide (20) une fois qu'il a été vidé de son fluide.
8. Procédé selon la revendication 7, dans lequel le premier des récipients de fluide (20) est recyclé après avoir été écrasé.

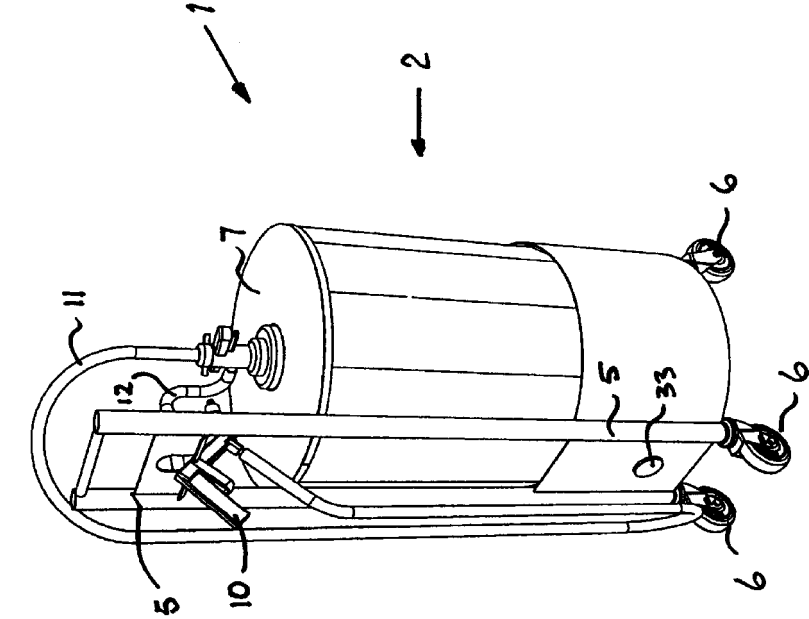


Fig.2

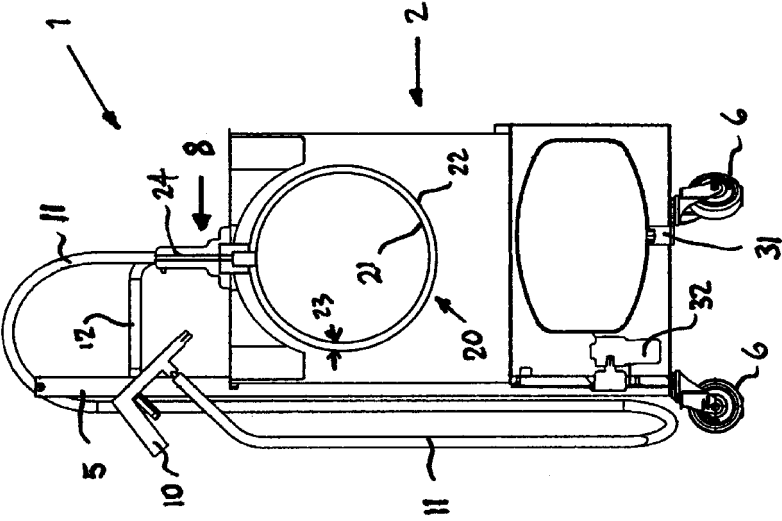
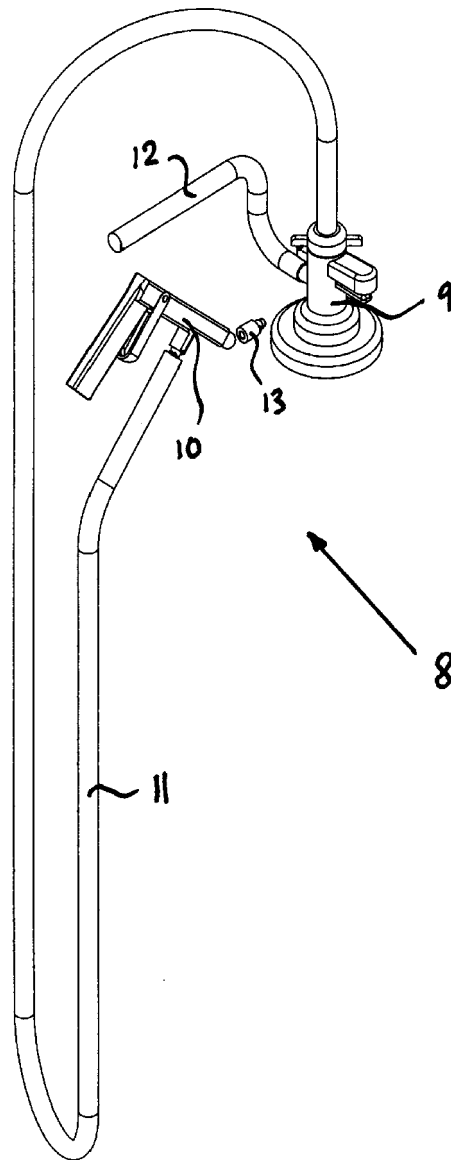


Fig.1

Fig.3



REFERENCES CITED IN THE DESCRIPTION

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