(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 008 700 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
10.03.2010 Bulletin 2010/10

(51) Int Cl.:
A63J 5/02 *(2006.01)*

(21) Application number: **08104484.4**

(22) Date of filing: **19.06.2008**

(54) **Device for scenographic use for production of artificial snow**

Vorrichtung für szenografischen Verwendung zur Herstellung von Kunstschnee

Dispositif pour utilisation scénographique pour la production de neige artificielle

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT RO SE SI SK TR

(30) Priority: **28.06.2007 IT MC20070132**

(43) Date of publication of application:
31.12.2008 Bulletin 2009/01

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Printed by Jouve, 75001 PARIS (FR)

Description

[0001] The present patent application for industrial invention relates to a device for scenographic use able to produce artificial snow.

[0002] The peculiarities and advantages of the said device will become evident after a short description of the prior technique and relevant inconveniences.

[0003] The so-called "falling polystyrene" technique is currently used to create a scenographic effect that simulates the falling of snow.

[0004] It is a closed circuit system in which polystyrene in small granules or fragments falls by gravity from a container positioned at a suitable height above the set.

[0005] In such a system the polystyrene fragments are collected in a recovery tank from which they are re-conveyed by means of forced ventilation through a suitable pipe into the aforementioned container for a new downward falling cycle.

[0006] Such a technology is however impaired by some considerable inconveniences.

[0007] In addition to large volume and difficult installation and set up of the said closed circuit system, the current technique is most of all impaired by the negative electrostatic magnetism phenomenon suffered by the aforementioned polystyrene fragments.

[0008] Such a phenomenon tends to negatively affect the falling of the "faked snow" by gravity, since the said polystyrene fragments are easily attracted by the surrounding objects and attached to them.

[0009] Moreover, the small polystyrene fragments are extremely sensitive to the effects of air draughts that may easily cause their uncontrolled dispersion during the falling by gravity, thus preventing them from being collected into the recovery tank from which a new operation cycle is to be started.

[0010] As an alternative solution to this empirical technology, devices known in the field as "foam machines" are used.

[0011] Each of these machines is provided with a tank that contains soapy water, which dispenses a thin flow of soapy water by means of a suitable electromagnetic valve towards a fabric cap inserted onto a metal union; in brief, it can be said that the soapy water progressively impregnates the fibres of the fabric cap.

[0012] A centrifugal fan actuated by a brush motor is installed at the opposite end of the union, which is designed to generate a powerful blast of air that is directed onto the said fabric cap from the back to the front, passing through its fibres.

[0013] In such a way, the powerful blast of air "transforms" the soapy water laid on the fabric into a vaporous foam that reproduces the effect of snow falling by gravity.

[0014] Also a similar foam machine is impaired by significant inconveniences, the first of all being represented by the very high noise level, which makes it impossible to use in situations where silence is required.

[0015] Reference is mainly made to crib scenes, and also to many other theatre situations.

[0016] The source of the very high noise level is to be identified in the powerful fan unit that generates the blast of air used to "beat up" the foam.

[0017] Moreover, it has been noted that in such a type of machines it would be impossible to reduced the noise level considerably, since such a result could only be obtained with using a fan unit with limited power that would not be able to produce the aforementioned "transformation" of soapy water into foam.

[0018] An additional functional limit of the said foam machines consists in the abundant production of spots of foam on the surface where they operate.

[0019] US2,571,069 discloses an apparatus for forming and dispensing artificial snow flakes including a foam material tank, an air compressor, a pipe for supplying water under pressure and a series of conduits for connecting the water pipe, the air compressor and the tank.

[0020] A careful examination of the problems that are typical of the prior technique has led to designing the new device of the invention, which is able to produce artificial snow of excellent quality without the aforementioned inconveniences.

[0021] The new device of the invention avoids the production of undesired spots of foam and most of all is able to operate very silently, thus being compatible with all types of sets.

[0022] Within the new machine of the invention, which produces artificial snow from soapy water, the idea of producing foam outside the storage tank (due to the strong acceleration given to the air towards the fabric impregnated with soapy water) has been discarded and the decision to produce a similar foam inside the storage tank of soapy water by means of a suitable membrane micropump has been taken.

[0023] Such an innovative solution, which will be better described below, has permitted to eliminate the traditional fan units with brush motors that were the exclusive cause of the unacceptable noise level of traditional machines.

[0024] In fact, also in the device of the invention, the "ready" foam that comes out from the tank must be conveyed towards a dispenser pipe; however, it must be noted that such a function can be advantageously entrusted to a small noiseless induction motor, due to the extremely light weight of the foam.

[0025] For purposes of clarity the description of the present invention continues with reference to the enclosed drawing, which is intended for purposes of illustration only and not in a limiting sense, wherein figure 1 is a block diagram of the device of the invention.

[0026] With reference to the said figure, the device of the invention comprises a tank (1) designed to be filled with soapy water, which is provided on the bottom with a microperforated nozzle (2) fed by the air produced by a membrane micropump (3) situated in external position on the tank (1).

[0027] The air dispensed by the nozzle (2) causes a

sort of vorticous mixing of the soapy water, thus producing foam that tends to fill the entire volume of the tank (1).

[0028] Once the volume has been filled up entirely, the foam is progressively poured outside through a suitable nozzle (4) on the upper wall (1 a) of the nozzle (4).

[0029] In such a context, the foam that progressively comes out of the nozzle (4) receives the blast of air generated by a centrifugal fan with very noiseless induction motor (5) installed on the back of the tank (1).

[0030] The foam that comes out of the tank (1) is very light and therefore can be conveyed by a weak air flow towards the area that is to receive the artificial snow.

[0031] It can otherwise be said that the foam coming out of the tank is subjected to a sort of delicate spraying by means of the fan with induction motor (5), which is able to create artificial snow flakes that fall by gravity in a very similar mode as natural snow.

[0032] The operation modes of the device of the invention ensure that the artificial snow is dry and therefore very light and vaporous.

[0033] These conditions guarantee that the artificial snow produced by the device of the invention tends to dissolve completely when touching the ground, without causing spots of humidity on the ground.

[0034] Additional advantages of the device of the invention refer to its capability to vary the size of the snow flakes by simply adjusting the load of the air flow received by the foam when it comes out of the tank, as well as to the capability to adjust the intensity of the artificial snow falling by suitably adjusting the power of the micropump.

[0035] It is equally important to note that the device of the invention is also appreciated because of lower production costs compared to traditional foam machines, due to elimination of the fan unit with brush motor in external position on the tank, of the relevant electromagnetic valves, conduits and taps that are typical of the prior technique.

[0036] Finally, it must be noted that the new device of the invention is able to produce a higher quantity of artificial snow than foam machines with the same amount of soapy water, thus ensuring a higher operation autonomy.

Claims

1. Device for scenographic use for production of artificial snow, comprising:

   - a tank for soapy water (1) with an outflow nozzle (4) in one of the lateral walls or in the upper wall; and
   - a device (5) in external position on the tank (1) designed to generate an air flow,

   characterised in that it further comprises

   - a microperforated nozzle (2) installed inside the tank (1) designed to provide pressurised air produced by a suitable generator (3) in external position on the tank (1), and

   said device (5) in external position on the tank (1) is arranged so that to generate an air flow incident to the longitudinal axis of the outflow nozzle (4).

2. Device as claimed in claim 1, **characterised in that** the external generator (3) that feeds the dispenser nozzle (2) consists in a membrane micropump.

3. Device as claimed in claim 1, **characterised in that** the device (5) used to produce a flow air consists in a centrifugal fan with induction motor.

Patentansprüche

1. Vorrichtung zur szenografischen Verwendung für die Herstellung von Kunstschnee umfassend:

   - einen Tank für Seifenwasser (1), der mit einer Ablauftülle (4) versehen ist, die an einer seiner Seitenwände oder an seiner oberen Wand ausgeführt ist sowie
   einen Apparat (5), der außerhalb des Tanks (1) vorgesehen ist und dazu dient, einen Luftstrom zu erzeugen

   dadurch gekennzeichnet, dass sie außerdem

   - eine Mikrofein-Düse (2) umfasst, die innerhalb des Tanks (1) installiert ist und dazu dient, Druckluft zu verteilen, die von einem im Innern des Tanks (1) vorgesehenen Generator (3) erzeugt wird, und
   dass die Vorrichtung (5) außerhalb des Tanks (1) so angebracht ist, dass ein Luftstrom erzeugt wird, der mit der Längsachse der Abflusstülle (4) zusammenfällt.

2. Vorrichtung gemäß Anspruch 1, **dadurch gekennzeichnet, dass** der äußere Generator (3), der die Verteilungsdüse (2) versorgt, aus einer Membran-Mikropumpe besteht.

3. Vorrichtung gemäß Anspruch 1, **dadurch gekennzeichnet, dass** der Apparat (5) zur Erzeugung eines Luftstroms aus einem Fliehkraftventilator mit Induktionsmotor besteht.

Revendications

1. Dispositif à usage scénographique se rapportant à la production de neige artificielle, comprenant :

- un réservoir pour de l'eau savonneuse (1) qui présente une embouchure de débit (4) réalisée en correspondance d'une de ses parois latérales ou de sa paroi supérieure, et
un appareil (5) prévu à l'externe du dit réservoir (1), apte à générer un flux d'air

caractérisé en ce qu'il comprend également

- une buse microperforée (2), installée à l'intérieur du réservoir (1), apte à débiter de l'air sous pression produite par un générateur (3) préposé à cet effet, prévu à l'externe du dit réservoir (1), et
dit dispositif (5) à l'extérieur du réservoir (1) est disposé de manière à générer un flux d'air incident avec l'axe longitudinal de la dite embouchure de débit (4).

2. Dispositif selon la revendication 1, **caractérisé en ce que** le dit générateur externe (3) qui alimente la buse de débit (2) consiste en une micropompe à membrane.

3. Dispositif selon la revendication 1, **caractérisé en ce que** le dit appareil (5) pour la production d'un flux d'air consiste en un ventilateur centrifuge doté de moteur à induction.

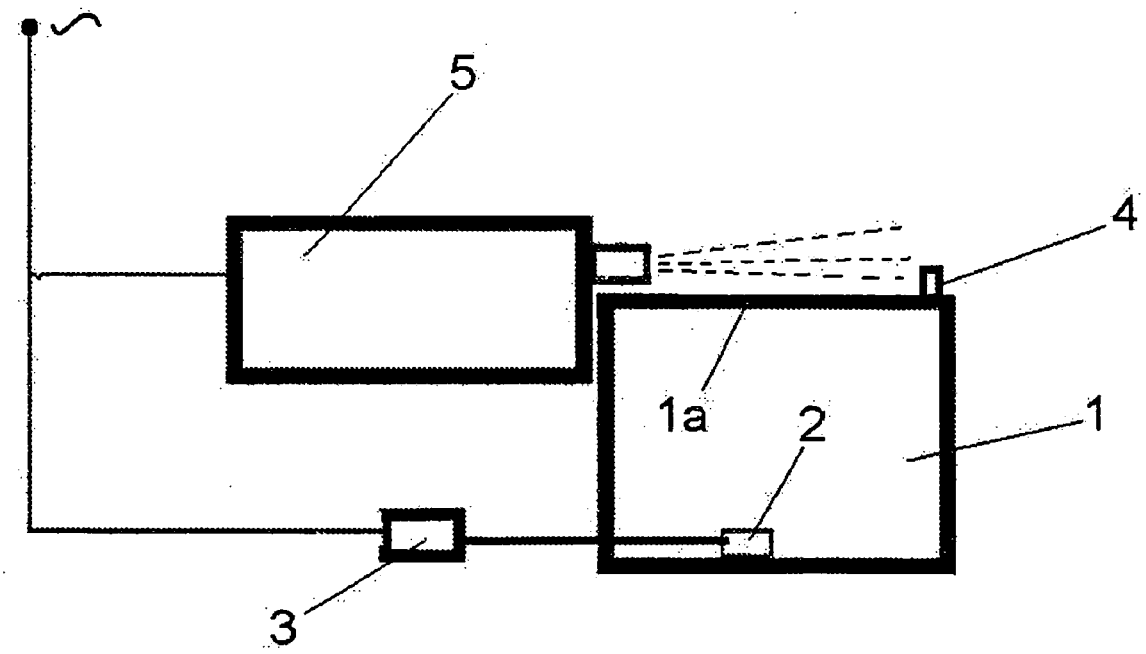


FIG. 1

REFERENCES CITED IN THE DESCRIPTION

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