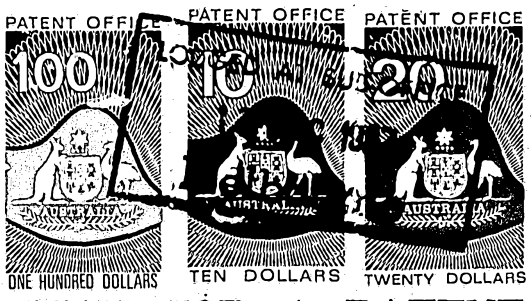
(CONVENTION. By one or more persons and

82652/87

COMMONWEA

597133

Patents



CONVENTION APPLICATION FOR A PATENT

TO VALUATION
130
ATTACHED

LODGED AT SUB-OFFICE
17 DEC 1987
Melbourne

(1) Here insert (in full) Name or Names of Applicant or Applicants, followed by address (es).

We (1) CdF CHIMIE AZOTE ET FERTILIZANTS

of 143, Route d'Espagne, B.P. NO. 3145, F-31053 Toulouse, France

hereby apply for the grant of a Patent for an invention entitled; (2)

IMPROVED PIPE REACTOR FOR THE MANUFACTURE OF AMMONIUM PHOSPHATES CONTAINING AMMONIUM SULFATE

(2) Here insert Title of Invention.

(3) Here insert number(s) of basic application(s)

which is described in the accompanying complete specification. This application is a Convention application and is based on the application numbered (3)

86.2922

(4) Here insert Name of basic Country or Countries, and basic date or dates

for a patent or similar protection made in (4) Greece

on 18th December 1986

APPLICATION ACCEPTED AND AMENDMENTS ALLOWED 1-3-90

My/Our address for service is Messrs. Edwd. Waters & Sons, Patent Attorneys, 50 Queen Street, Melbourne, Victoria, Australia.

DATED this 16th day of December 19 87

(5) Signature (s) of Applicant (s) or Seal of Company and Signatures of its Officers as prescribed by its Articles of Association.

(5) CdF CHIMIE AZOTE ET FERTILIZANTS

By James Murray

Registered Patent Attorney

To:

5291 Australia

(CONVENTION. Company.) Form 8

COMMONWEALTH OF AUSTRALIA

Patents Act 1952-1969

DECLARATION IN SUPPORT OF A CONVENTION APPLICATION FOR A PATENT OR PATENT OF ADDITION

(1) Here insert (in full) Name of Company.

In support of the Convention Application made by(1) CDF CHIMIE AZOTE ET FERTILIZANTS

(hereinafter referred to as the applicant) for a Patent for an invention entitled:(2) IMPROVED PIPE REACTOR FOR THE MANUFACTURE OF AMMONIUM PHOSPHATES CONTAINING AMMONIUM SULFATE

(2) Here insert title of Invention.

(3) Here insert full Name and Address, of Company official authorized to make declaration.

I,(3) Jean-Pierre HALBRON of 143 Route d'Espagne, B.P. No. 3145, F-31053 Toulouse, France

do solemnly and sincerely declare as follows:

1. I am authorised by the applicant for the patent to make this declaration on its behalf.

2. The basic application as defined by Section 141 of the Act was made in(4) Greece on the 18th day of december 1986, by SOCIETE DES INDUSTRIES CHIMIQUES DU NORD DE LA GRECE

(4) Here insert basic Country or Countries followed by date or dates and basic Applicant or Applicants.

~~or~~

3. DIMITRIOS BELIS, Arrianou 16, 546 35 Thessalonique, Greece PIERRE CHINAL, 23 Rue des Haies, F-76160 Martin Du Vinier, France and JEAN FRANCOIS PRIAT, 23 Rue des Capucines, F-76420 Bihorel, France

(5) Here insert (in full) Name and Address of Actual Inventor or Inventors.

is/~~are~~ the actual inventors of the invention and the facts upon which the applicant is entitled to make the application are as follow:

The applicant is the assignee of the said SOCIETE DES INDUSTRIES CHIMIQUES DU NORD DE LA GRECE who in turn is the assignee of the said actual inventors

4. The basic application referred to in paragraph 2 of this Declaration was the first application made in a Convention country in respect of the invention the subject of the application.

DECLARED at Toulouse, France this 24th day of March 19 88

(6) Signature.

(6) [signature]

(12) PATENT ABRIDGMENT (11) Document No. AU-B-82652/87
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 597133

(54) Title
IMPROVED PIPE REACTOR FOR THE MANUFACTURE OF AMMONIUM PHOSPHATES CONTAINING AMMONIUM SULFATE

International Patent Classification(s)
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(71) Applicant(s)
CDF CHIMIE AZOTE ET FERTILIZANTS

(72) Inventor(s)
DIMITRIOS BELIS; PIERRE CHINAL; JEAN FRANCOIS PRIAT

(74) Attorney or Agent
WATERMARK MELBOURNE

(56) Prior Art Documents
DE 2048662

(57) Claim

1. An improved pipe reactor for the manufacture of ammonium phosphates containing ammonium sulfate fitted at its head with feed pipes for phosphoric acid, sulfuric acid, liquid ammonia and water and/or washing brines, characterized in that feed pipe for water and/or washing brines and feed pipe for liquid ammonia are concentric and axially set in respect of the axis of the pipe reactor and that the feed pipe for water and/or washing ~~waters~~ brines is set inside the feed pipe for liquid ammonia.

597133

Form 10

COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1952-69

COMPLETE SPECIFICATION

(ORIGINAL)

Class Int. Class

Application Number:
Lodged:

Complete Specification Lodged:
Accepted:
Published:

Priority :

This document contains the amendments made under Section 49 and is correct for printing.

Related Art :

Name of Applicant : CdF CHIMIE AZOTE ET FERTILIZANTS

Address of Applicant : 143, Route d'Espagne, B.P. No. 3145, F-31053 Toulouse, France

Actual Inventor: DIMITRIOS ARRIANOU BELIS, PIERRE CHINAL and JEAN FRANCOIS PRIAT

Address for Service : EDWD. WATERS & SONS,
50 QUEEN STREET, MELBOURNE, AUSTRALIA, 3000.

Complete Specification for the invention entitled:

IMPROVED PIPE REACTOR FOR THE MANUFACTURE OF AMMONIUM PHOSPHATES CONTAINING AMMONIUM SULFATE

The following statement is a full description of this invention, including the best method of performing it known to :- us

IMPROVED PIPE REACTOR FOR THE MANUFACTURE OF AMMONIUM PHOSPHATES CONTAINING AMMONIUM SULFATE.

The present invention relates to an improved pipe reactor for the manufacture of ammonium phosphates containing ammonium sulfate. These ammonium sulfate containing ammonium phosphates are used as fertilizers and the proportion of ammonium sulfate varies with the desired fertilizer formula.

Pipe reactors are well known. They are composed by a length of pipe containing no inside stuffing. Most generally used pipe reactors are horizontally set or stands at small angle to an horizontal line (at most 45°). They have an inside diameter ranging between 200 mm and 10 mm and a length ranging between 1.50 meter and 10 meters. The ratio length/diameter is usually not below 50. Pipe reactors have been described for example in the following patents : USP 3,954,942 and 3,310,371 and French Patents 2,172,826 and 2,199,478.

Pipe reactors are used for the neutralization by ammonia of acids, more particularly of phosphoric acid for the manufacture of ammonium phosphates ~~or~~ or polyphosphates or of mixtures of phosphoric acid and sulfuric acid. Generally pipe reactors are located at the inlet of a granulator or a dryer. The gas flowing out of granulator or dryer are washed and washing brines are often recycled in the fertilizer unit, particularly in the pipe reactor.

The present invention relates to a pipe reactor for manufacturing ammonium phosphates containing ammonium sulfate in which water and/or washing brines are introduced. In the latter case, as a mixture of phosphoric and sulfuric acid is neutralized many corrosion problems arise. In order to lessen corrosion it has been proposed to dilute ammonia with water and/or washing brines (USP 3,954,942) but the ammonia injector is still corroded. It is quite impossible to dilute sulfuric acid before its introduction in

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the pipe reactor because sulfuric acid dilution is highly exothermic. One of the solutions presently used is the predilution of phosphoric acid. But corrosion risks do not reach zero and it is necessary to sheath with polytetrafluoroethylene the whole internal surface of the head of the pipe reactor. But the setting of the sheath requests for difficult finishing and fitting, more specially as polytetrafluoroethylene has a high dilatation coefficient. Furthermore no piece of polyfluorotetraethylene having large dimensions are commercialized and a great number of pieces must be adjusted in order to sheath the head of the pipe reactor. The applicant has tried to introduce into the pipe ~~water~~ reactor (water) and/or whahing brines and ammonia through two pipes parallel to the axis of the pipe reactor. But then the corrosion of the water and/or washing brines pipe is very rapid.

The pipe reactor according to the present application allows to prepare ammonium phosphates containing ~~ammonium phosphate~~ (sulfate) without corrosion problem.

The present invention concerns an improved pipe reactor for the manufacture of ammonium phosphates containing ammonium sulfate fitted at its head with pipes for feeding phosphoric acid, sulfuric acid, liquid ammonia and water and/or washing brines characterized in that the feeding pipe for water and/or washing brines and the feeding pipe for liquid ammonia are concentric and axially mounted with respect to the axis of the pipe reactor and in that the feeding pipe for water and/or washing brines is fitted inside the feeding pipe for liquid ammonia.

It has been noted that no corrosion takes place, particularly no corrosion of the feed pipe for water and/or washing brines.

The description given herebelow of an improved pipe reactor and the annexed figure will allow to better understand the invention.

The annexed figure is a partial longitudinal cross-section of a pipe reactor (1).

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According to the embodiment shown on the figure the head of the pipe reactor is fitted with a feed pipe (2) for a mixture of sulfuric and phosphoric acid. This feed pipe opens perpendicularly in the pipe reactor (1). The feed pipe (2) could open tangentially in the pipe reactor (1). Phosphoric acid and sulfuric acid could also be introduced through two separate pipes, preferably diametrically set, these two pipes opening either perpendicularly or tangentially with respect to the pipe reactor (1). Feed pipe (3) for water and/or washing brines and feed pipe (4) for liquid ammonia are axially mounted in the pipe reactor (1). Feeding pipes (3) nd (4) are concentric and feed pipe (3) for water and/or washing brines is inside feed pipe (4) for ammonia. Liquid ammonia flows in the annular space provided between feed pipes (3) and (4). Therefore water and/or washing brines are cooled by liquid ammonia. Feed pipes (3) and (4) are preferably made out of stainless steel. The external surface of feed pipe (4) for liquid ammonia can optionally be coated with polyfluorotetraethylene.

EXAMPLE

In a pipe reactor having an inside diameter of 150 mm and a length of 5,00 m are introduced :

12 t/h of liquid ammonia

18 m^3/h of 93 % sulfuric acid

30 m^3/h of 26 % phosphoric acid

12 m^3/h of washing brines issued from the granulation unit.

When a pipe reactor is used having the same head as that represented on annexed figure except that the feeding pipe (3) for washing brines and feeding pipe (4) for liquid ammonia are not concentric, but separated and parallel to the axis of tube (1). The feeding tube (3) for washing brines is eaten away in less than 10 days.

When, as represented on the annexed figure, feed pipes (3) and (4) are concentric, feed pipe is not eaten away after one year.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. An improved pipe reactor for the manufacture of ammonium phosphates containing ammonium sulfate fitted at its head with feed pipes for phosphoric acid, sulfuric acid, liquid ammonia and water and/or washing brines, characterized in that feed pipe for water and/or washing brines and feed pipe for liquid ammonia are concentric and axially set in respect of the axis of the pipe reactor and that the feed pipe for water and/or washing ~~waters~~ brines is set inside the feed pipe for liquid ammonia.

2. An improved pipe reactor as claimed in claim 1, substantially as herein described with reference to the accompanying figures and the example.

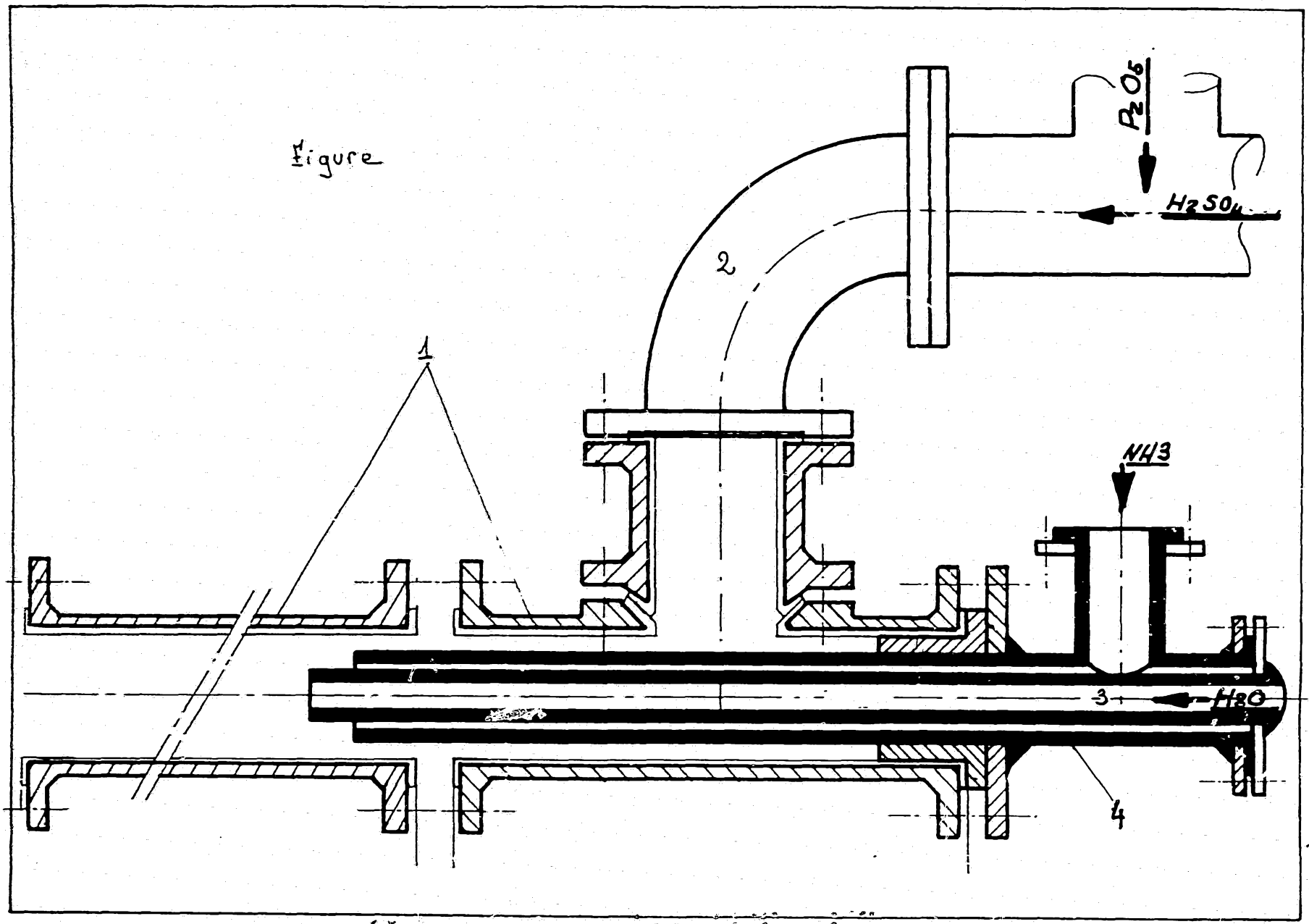
DATED this 16th day of December 1987.

CdF CHIMIE AZOTE ET FERTILIZANTS

EDWD. WATERS & SONS
PATENT ATTORNEYS
50 QUEEN STREET
MELBOURNE. VIC. 3000.

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Figure



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