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(54) Title: LIQUID COATING MATERIALS AUTO SUPPLY SYSTEM

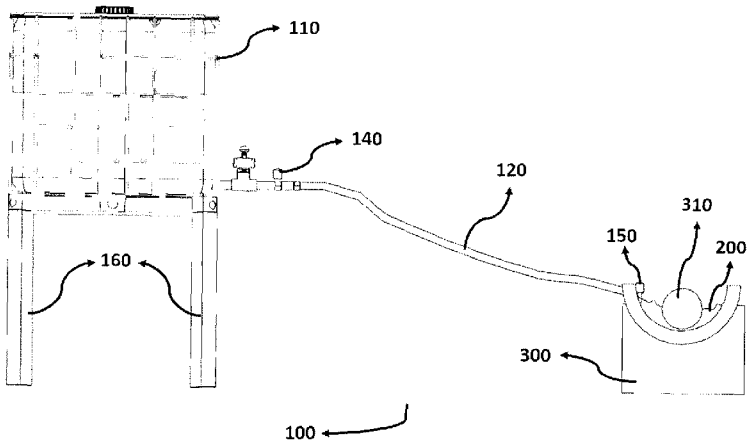

Figure-1

(57) Abstract: The invention is related to coating liquid supply system (100) to be used in coating having a structure which increases operational efficiency and final product quality which is used in liquid coating engines on solid surfaces. The invention is particularly related to an auto liquid coating supply system (100) which transmits the coating liquid (200) with the natural velocity from a closed liquid tank (110) which is located at a higher level of coating engine liquid trough (300), provides level control on coating engine liquid trough (300) by the feedbacks received from level control sensor (150) on coating engine liquid trough (300), flow with the help of pneumatic actuator (170) and coating liquid (200) passage in supply pipe (130) by the feedbacks received from the flow control sensor (140) on supply pipe (130).

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SPECIFICATION

LIQUID COATING MATERIALS AUTO SUPPLY SYSTEM

TECHNICAL FIELD RELATED TO THE INVENTION

Invention is related to a coating liquid supply system having productive structure in terms of operational efficiency and final product quality which is used in liquid coating engines on solid surfaces.

Invention is particularly related to a liquid coating auto supply system transmitting liquid to be used in coating with natural velocity from a closed tank located on the upper level of trough within liquid coating engines on all types of solid surfaces, providing level control on trough which is located in coating equipment by means of feedbacks receiving from sensors on unit and flow control by means of valves on the supply line.

Prior art:

Trading considerably developed by the reason of the fact that mankind become sedentary. The most important part of trading comprises of food stuff. Resistant packages against deterioration are developed in order to prevent the products to be damaged.

Package representing the mark and goods in every aspect which ideally protects the product inside and provides hygienic conditions includes all types of materials ensuring that the food stuff is safely protected, stored and sent to the consumer.

Recently, there are various methods of packaging. One of these methods provides the package to be prepared by pasting package film with the coating liquid.

In this method, the engines send the mentioned liquid to the coating liquid trough with the help of constant pump from a reservoir on the ground which is located near coating liquid units.

Related to prior art, liquid is constantly pumped from the liquid supply reservoir which is placed at a lower level of the application point to the liquid trough in which coating equipment is located. The less the liquid amount in reservoir, more liquid is manually added to the reservoir with buckets. Liquid backflow constantly is circulated from a space within the trough of the coating equipment.

Related to prior art, in the method used, delivery to the trough by pumping from near-by unit with the help of the pump and a constant circulation, air bleeding of coating liquid and flapping effect exposure are the factors that are harmful for the internal structure of liquid and they are the factors that cause the product quality to be damaged.

Related to prior art, in the method used, due to the fact that the coating liquid is foamed, many problems are brought related final product quality as a result of pumping.

Related to prior art in the method used, the less the liquid amount in trough, workers should manually and constantly supply to the reservoir with coating liquid buckets.

Related to prior art, in the method used, some obstruction are faced in the pump and the supply line during long-term practices.

As a result of preliminary investigation related to the prior art, **"CN202387655"** numbered patent file is investigated. This patent is related to "buffer tank, air discharge device, level sensor, mixer, perpendicular drive unit, plastic reservoir, scraper, adhesive injection device containing junction pipe and

rubber piping". In this invention, supplement is provided with adhesive air discharge device which is located in the reservoir. Sensor solely controls the adhesive amount in the reservoir.

As a result of preliminary investigation related to the prior technique, **"CN202608120"** numbered patent file is investigated. This patent is related to "adhesive supply device of a sack base banding engine". The adhesive supply system mentioned includes a high-pressure adhesive drum, an adhesive and a temporary storage tank. In this invention, in order to control adhesive supply device and pressure, electrically control valve pressure sensors are used. With these sensors, high pressure area is completely closed and adhesive is drifted apart air.

As a result, due to the negativities mentioned above and inefficiency of the present solutions related to the subject, a development is needed in related technical field.

PURPOSE OF THE INVENTION

The most important purpose of the invention is that it is automatically sent to the trough by minimizing contact with air of the coating liquid, without flapping, pumping or without any need to the extra workers. Herewith, coating liquid quality and final product quality is increased.

Another important purpose of the invention is that the coating liquid is sent with the natural velocity from a closed tank which is located at a higher level of the application point.

Another important purpose of the invention is that the obstructions are prevented which arise in pump of the long-term practices and supply line by sending coating liquid with the natural velocity.

Another important purpose of the invention is that flow time and liquid level control in trough can be automatically controlled due to the feedback received from the sensors.

Another important purpose of the invention is that sending the coating liquid to the reservoir makes work force and production efficiency increase.

Structural and characteristic features of the invention will be understood due to all the advantages indicated below with the embodiments and detailed descriptions referring to them. Therefore, evaluation should be carried out by taking these embodiments and detailed descriptions into consideration.

EXPLANATION OF THE EMBODIMENTS

FIGURE -1; is an illustration that shows overall side view of coating liquid supply system which is the subject of the invention.

FIGURE -2; is an illustration that shows perspective view of coating liquid supply system which is subject of the invention.

FIGURE -3; is an illustration that shows valve and pneumatic actuator components of the system which is the subject of the invention.

FIGURE -4; is an illustration that shows rear section detail view of auto supply components of coating liquid supply system which is the subject of the invention.

FIGURE -5; is an illustration that shows side view of auto supply components of coating liquid supply system which is the subject of the invention.

FIGURE -6; is an illustration that shows rear perspective view of auto supply components of coating liquid supply system which is the subject of the invention.

Reference numbers:

100. Coating liquid supply system

110. Liquid Tank

120. Feed Hose

130. Supply Pipe

140. Flow Control Sensor

141. Sensor Cable Entry

150. Level Control Sensor

160. Pedestal

170. Pneumatic Actuator

171. Valve Status Information Indicator

172. Air Hose Intakes

180. Valve

200. Coating liquid

300. Coating Engine Liquid Trough

310. Coating Equipment

EXPLANATION OF THE INVENTION:

Coating liquid supply system (100) which is the subject of the invention comprises; level control sensor (150) that controls level control of coating liquid (200) on coating engine liquid trough (300); flow control sensor (140) that controls coating liquid (200) passage in supply pipe (130); pedestal (160) that provides liquid tank (110) to be located at a higher level of coating engine liquid trough (300); level control sensor (150) and pneumatic actuator (170) that provides fluid passage with the help of valve (180) and by way of the information received from level control sensor (140); and valve status information indicator (171) that indicates whether coating liquid flow is provided to the user or not.

In the coating liquid supply system (100) which is subject of the invention, coating liquid (200) is filled into the liquid tank (110) by a user and/or availably dispatched after it is filled by producer. Coating liquid (100) in liquid tank (110), coating engine is directed to the liquid trough (300). The purpose herein is to provide coating liquid (200) which is required to the engine constantly remains in coating engine liquid trough (300) by supplying the engine with coating liquid (200).

Working principle related to the coating liquid supply system (100) is that level control sensor (150) at a higher level of coating engine liquid trough (300) sends signal to the pneumatic actuator (170) when the coating liquid (200) on coating engine liquid trough (300) decreases. Flow control sensor (140) in supply pipe (130) works in synchronization with Level control sensor (150) at a higher level of coating engine liquid trough (300).

When level control sensor (150) on coating engine liquid trough (300) detects that coating liquid (200) decreases, it sends

command to the pneumatic actuator (170) in order to open valve (180). Herewith, the coating liquid (200) in liquid tank (110) is first transmitted to the supply pipe (130) then to the coating engine liquid trough (300) with the feed hose (120) which is contacted to the end of the supply pipe (130). After the arranged time, if supply pipe (130) on flow sensor (140) cannot detect adequate liquid (200) flow from supply pipe (130), it informs that liquid amount in the tank decreases by sending warning to an external system and the tank is filled or changed.

Coating liquid (200) which is transmitted to coating engine liquid trough (300), is transmitted to coating equipment (310) and the coating liquid (200) on it is also transmitted to package films and the films are covered with coating liquid.

When the coating liquid (200) flow continues, if the flow control sensor (140) detects coating liquid (200) flow in the supply pipe (130) and level control sensor (150) cannot detect adequate amount of coating liquid (200), pneumatic actuator (170) keeps the valve (180) open.

If level control sensor (150) on coating engine liquid trough (300) detects that coating liquid (200) measures up at an adequate level, it sends command to the pneumatic actuator (170) to close the valve (180). Herewith, the flow is automatically controlled.

When the flow continues, there is valve status information indicator (171) on pneumatic actuator (170) in order to make the user control the flow condition. Herewith, the user can control whether the flow is provided or not.

In order to make the pneumatic actuator (170) support needed pressure, there are air hose intakes (172) on the pneumatic actuator (170). Pressure air is transmitted to the pneumatic actuator (170) with air hoses that connected to these air hose intakes (172), herewith, the pneumatic actuator (170) can make the valve (180) move.

Level control sensor (150) and flow control sensor (140) are connected each other with cables. This cable connection is provided with sensor cable entry (141). Herewith, these sensors (140) work with synchronization.

Pedestal (160) provides coating engine liquid trough (300) stand at a higher level, thus, a natural velocity is provided with the pressure it is exposed and potential energy it had to the coating liquid (200).

As a result, coating liquid supply system (100) which is the subject of the invention provides that coating liquid is automatically sent to coating engine liquid trough (300) by minimizing the air contact of coating liquid (200) without flapping, pumping or without any need to the extra workers. Herewith, coating liquid (200) quality and final product quality is increased, work force is provided, and obstructions arise in the pump and the supply line in long-term practices are prevented.

CLAIMS

1. The invention is a coating liquid supply system (100) used in liquid coating engines on solid surfaces which has the ability of auto supply and provides coating liquid (200) needed constantly remains in coating engine liquid trough (300) **is characterized by;**

    - **Flow control sensor (140)** which controls coating liquid (200) passage on the supply pipe (130),
    - **Level control sensor (150)** which controls level control sensor of coating liquid (200) in coating engine liquid trough (300),
    - **Pedestal (160)** provides coating engine liquid trough (300) stand at a higher level of the liquid tank (110), thus, a natural velocity is provided with the pressure it is exposed and potential energy it had to the coating liquid (200),
    - **Pneumatic actuator (170)** which controls coating liquid (200) flow with the information received from flow control sensor (140)

    and level control sensor (150),

2. According to Claim 1, coating liquid supply system (100) **is characterized that; valve status information indicator (171)** indicates if coating liquid flow of pneumatic actuator (170) is provided to the user.

3. According to Claim 1, coating liquid supply system (100) **is characterized that;** level control sensor (150) in coating engine liquid trough (300) on solid surface works in synchronization with flow control sensor (140) supply pipe (130).

4. According to Claim 1, coating liquid supply system (100) **is characterized that;** it has air hose intakes (172) which are located on pneumatic actuator (170) providing pressure power needed to the pneumatic actuator (170).

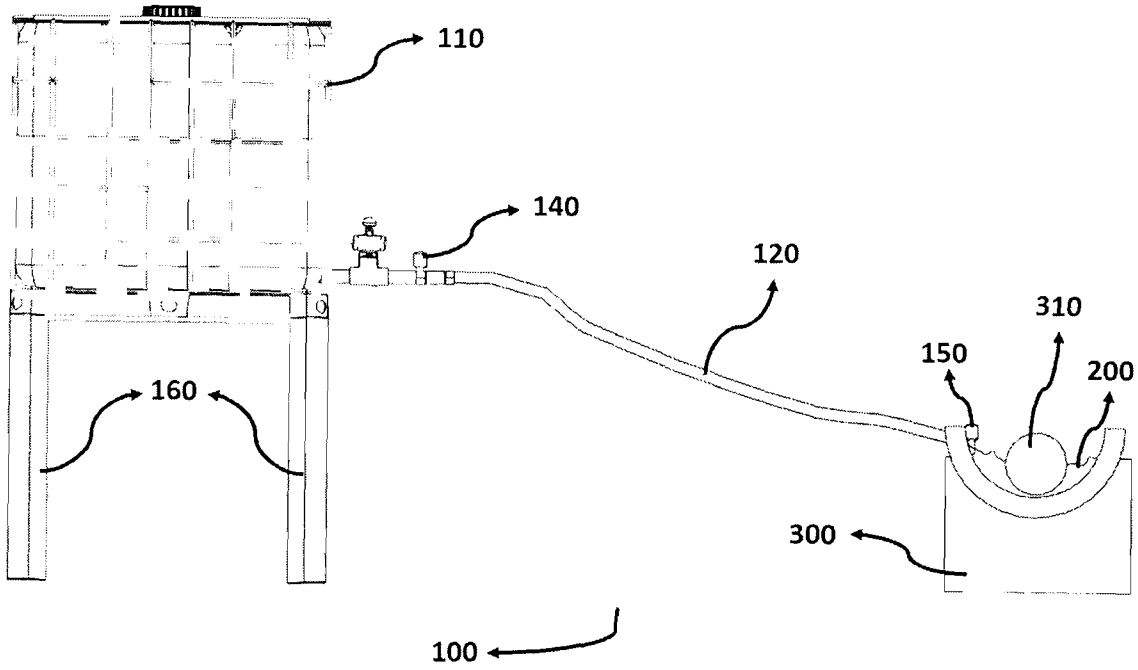

Figure-1

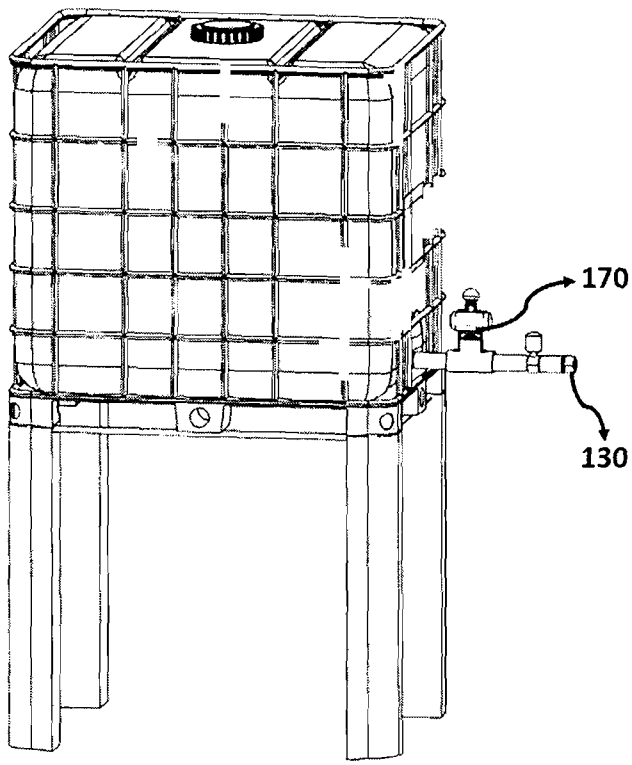

Figure-2

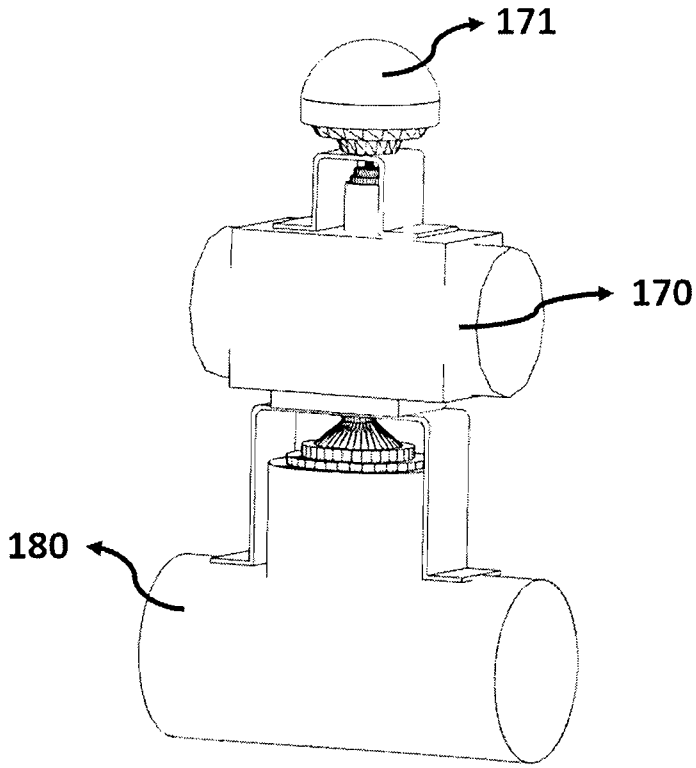

Figure-3

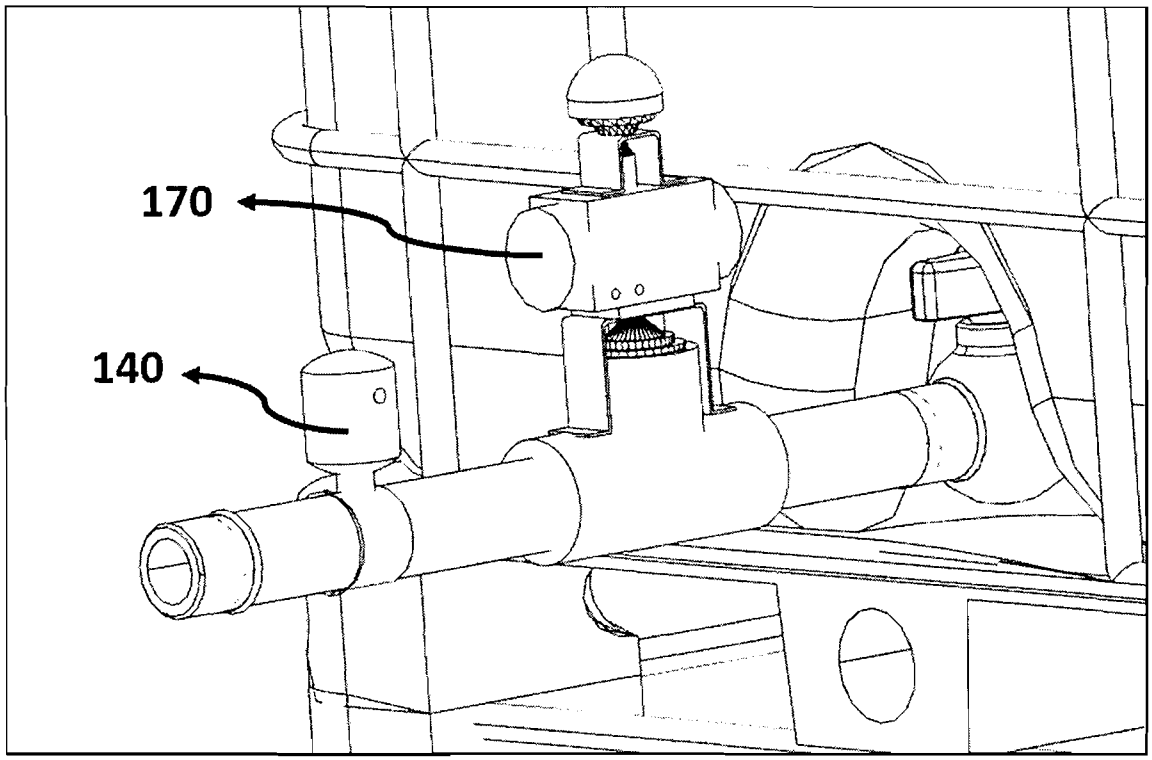

Figure-4

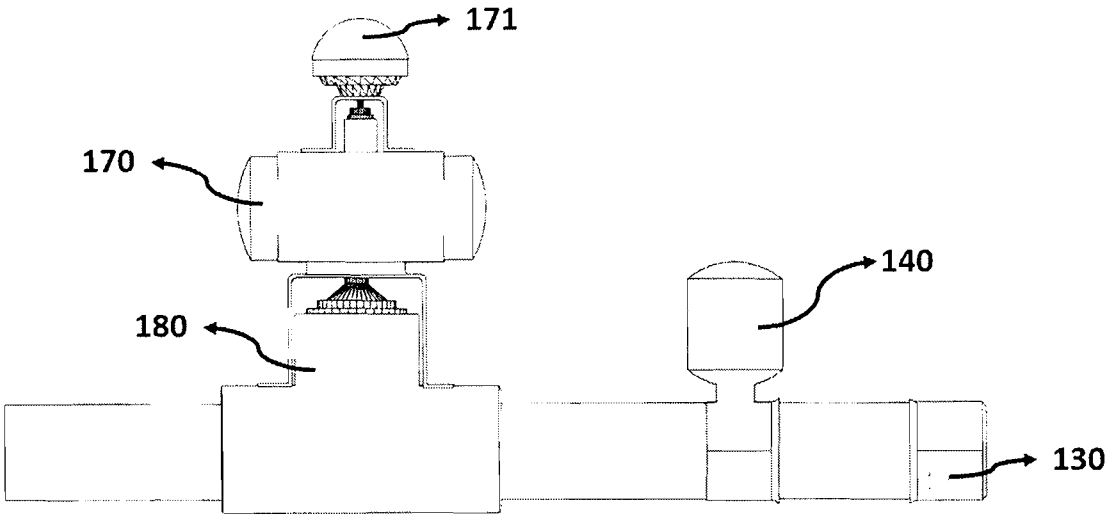

Figure-5

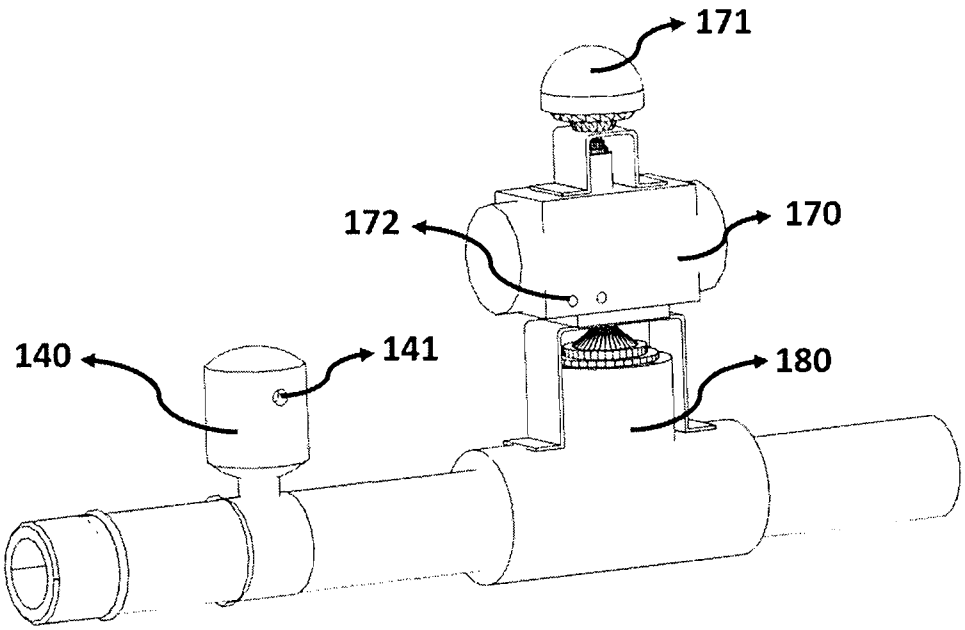

Figure-6

INTERNATIONAL SEARCH REPORT

International application No
PCT/TR2016/000098

A. CLASSIFICATION OF SUBJECT MATTER
INV. B05C3/09 B05C11/10 G05D9/12
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B05C G05D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 1 308 302 A (GALLWEY CHEMICAL CO LTD) 21 February 1973 (1973-02-21)	1,2,4
A	page 3, line 95 - page 4, line 17 figure 2	3

X	US 1 593 789 A (BEAUSEJOUR REME A) 27 July 1926 (1926-07-27) page 3, line 16 - line 53 figure 4	1,2,4

X	EP 0 289 763 A2 (SASIB SPA [IT]) 9 November 1988 (1988-11-09) column 3, line 11 - line 44; figures	1,2,4

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
1 December 2016	08/12/2016

Name and mailing address of the ISA/	Authorized officer
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/TR2016/000098

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 1308302 A	21-02-1973	NONE	
US 1593789 A	27-07-1926	NONE	
EP 0289763 A2	09-11-1988	EP 0289763 A2	09-11-1988
		IT 1208291 B	12-06-1989