



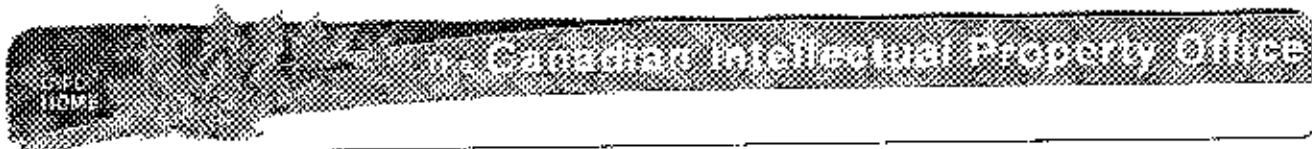
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**Canadian Patents Database**

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(12) Patent:

(54) MANUFACTURE OF METHYL ALCOHOL AND OTHER OXYGENATED ORGANIC COMPOUNDS  
(54) PRODUCTION D'ALCOOL METHYLIQUE ET D'AUTRES COMPOSES ORGANIQUES OXYGENES

(72) Inventors (Country): **FRANZ LAPPE (Not Available)  
GEORGE SUERN (Not Available)  
MATHIAS PIER (Not Available)**

(73) Owners (Country): **BADISCHE ANILIN AND SODA FABRIK**

(71) Applicants (Country):

(74) Agent:

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Patent Cooperation Treaty (PCT): **No**

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Availability of license: **N/A**  
Language of filing: **Unknown**

**ABSTRACT:**

CLAIMS: Show all claims

\*\*\* Note: Data on abstracts and claims is shown in the official language in which it was submitted.

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## Specification.

TO ALL WHOM IT MAY CONCERN:

Be it known that we, MATHIAS PIER, WILHELM RUMPF, GEORG STERN and FRANZ LAPPE, the first of Heidelberg, the second and fourth of Ludwigshafen-on-Rhine and the third of Neckargomünd, Germany, having jointly invented a certain new and useful improvement in the MANUFACTURE OF METHYL ALCOHOL AND OTHER OXYGENATED ORGANIC COMPOUNDS, do hereby declare that the following is a full, clear and exact description of the same.

Recently it has been found that methyl alcohol and other oxygenated organic compounds can be produced synthetically from mixtures of carbon monoxid and hydrogen by the action of proper catalysts and at an elevated temperature and pressure. In practically performing the said reaction, the action of the catalyst often deteriorates more or less quickly, methane or higher hydrocarbons being formed to a greater or lower degree instead of alcohols or other oxygenated compounds. Even by lining the hot reaction vessel with copper, in order to prevent a decomposition of carbon monoxid by the iron walls with the formation of a carbon deposit, the deterioration aforementioned is not avoided. We have found that the said drawback is due to the fact that the action of the contact mass is strongly influenced by volatile compounds of iron, especially iron carbonyl, or by the iron deposits formed by such compounds.

We have also found that the deterioration of the contact mass is avoided if the hot parts of the apparatus coming into contact with carbon monoxid, especially the reaction vessel and metallic parts arranged therein, such as supports for the catalytic mass, electric heating bodies, heat exchangers and so on, are coated or lined with, or made of, metals, or metal alloys which are sufficiently resistant to carbon monoxid and the temperature under the conditions of working, and if the less hot and cold parts of the apparatus are also provided with similar means in order to prevent iron particles, or compounds, reaching from there the hot zone containing

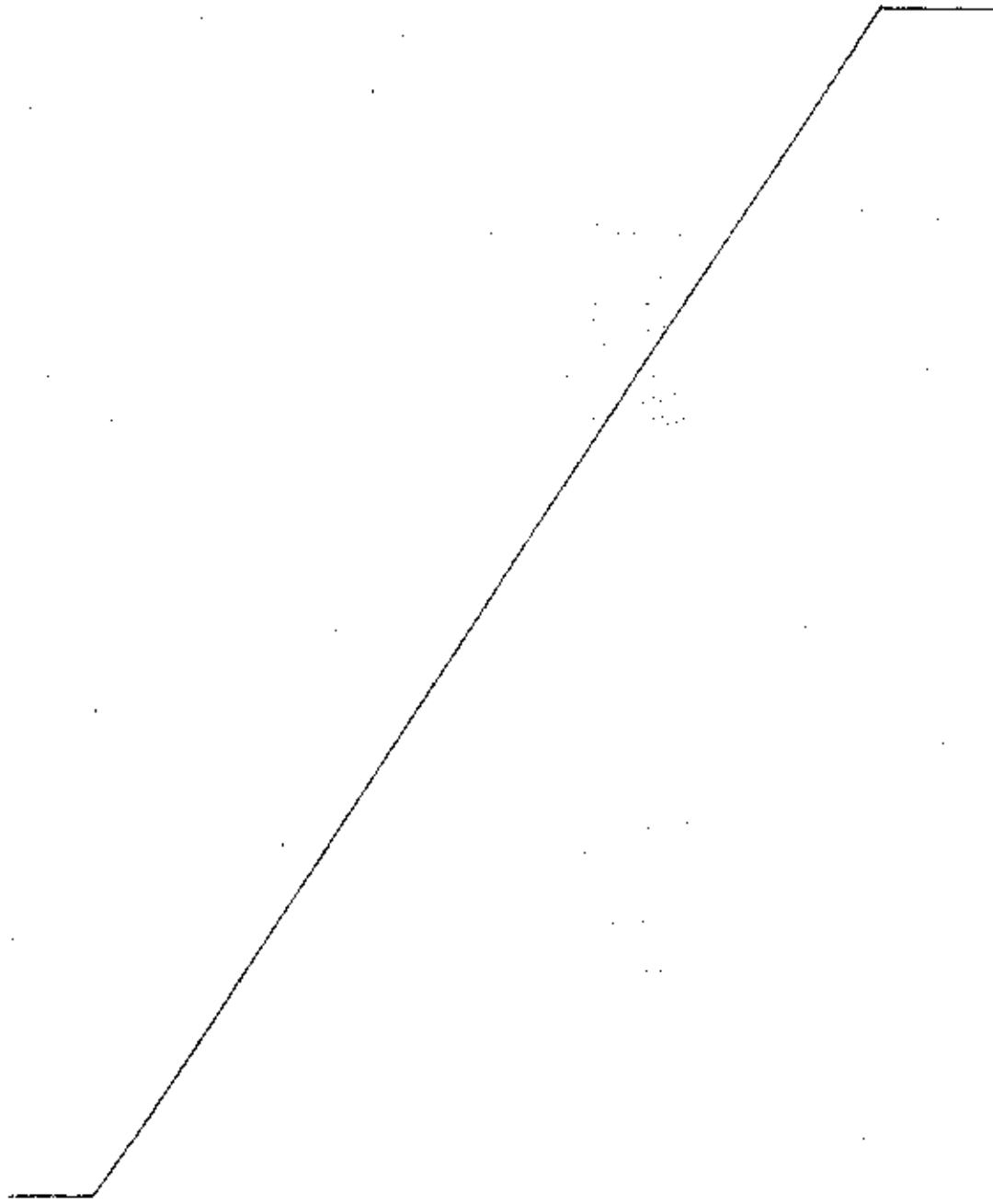
the catalyst. According to the invention the hot parts are made of, or lined or coated with, copper, silver, aluminium, or their alloys, or special steel containing a substantial amount of chromium, manganese, tungsten, molybdenum or vanadium, or coated with the last-named metals. For the less hot or cold parts of the apparatus, for example the high pressure piping, the same metals or alloys or coatings or linings thereof, may be employed, but metals of a lower melting point, such as zinc, tin, lead, or their alloys, are also suitable for these parts, or the latter may be protected by non-metallic materials, for example coated with asphalt or enamelled.

As regards the use of aluminium, it may be added that it is only suitable where the temperatures are not too high. The temperature up to which its use is permitted depends to a certain degree on the pressure, more exactly speaking the partial pressure of the carbon monoxide, inasmuch as the temperature may be the higher, the lower the pressure, or partial pressure, of the carbon monoxide is. Generally speaking, the temperature limit up to which aluminium can be used is about 550 degrees Centigrade. As to the special steels, that known under the brand "Steel V2A" (of the firm of Krupp) containing 20 per cent of chromium, 7 per cent of nickel, 0.27 per cent of carbon, 0.45 per cent of silicon and 0.35 per cent of manganese may be cited as an example. Such material is used with advantage for the electric heating resistance for the initial heating and, if necessary, further supplemental heating of the gas mixture. The coatings of chromium, tungsten and so on mentioned above can be produced in a satisfying manner by electro-deposition, for example electro-chroming and so on.

In other respects, the performance of the catalytic process is not altered by applying the present invention.

In order to protect the walls which are exposed to the high pressure, against the action of the hot compressed hydrogen, the

vention may be combined with the known suggestions for working with hydrogen under a high pressure, thus employing for example a copper tube surrounded with a perforated or otherwise permeable steel mantle, or employing an iron tube lined inside with a thin tube consisting of one of the aforesaid metals or coated with the latter, and simultaneously protected by a permeable steel mantle capable of resisting the pressure .



## S p e c i f i c a t i o n .

TO ALL WHOM IT MAY CONCERN:

Be it known that we, MATHIAS PIER, WILHELM RUMPF, GEORG STERN and FRANZ LAPPE, the first of Heidelberg, the second and fourth of Ludwigshafen-on-Rhine and the third of Neckargemünd, Germany, having jointly invented a certain new and useful improvement in the MANUFACTURE OF METHYL ALCOHOL AND OTHER OXYGENATED ORGANIC COMPOUNDS, do hereby declare that the following is a full, clear and exact description of the same .

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We have also found that the deterioration of the contact mass is avoided if the hot parts of the apparatus coming into contact with carbon monoxid , especially the reaction vessel and metallic parts arranged therein, such as supports for the catalytic mass, electric heating bodies, heat exchangers and so on, are coated or lined with, or made of, metals, or metal alloys which are sufficiently resistant to carbon monoxid and the temperature under the conditions of working, and if the less hot and cold parts of the apparatus are also provided with similar means in order to prevent iron particles, or compounds, reaching from there the hot zone containing

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