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PROVISIONAL SPECIFICATION

International classification—CO9d 9/00

IMPROVEMENTS IN OR RELATING TO PAINT STRIPPER

COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH, RAFI MARG, NEW DELHI-1, INDIA, AN INDIAN REGISTERED BODY INCORPORATED UNDER THE REGISTRATION OF SOCIETIES ACT (ACT XXI OF 1860).

The following specification describes the nature of this invention

This is an invention by Kummattithidal Santhanam RAJAGOPALAN, Subbiah Nadar GURUVIAH, Scientists and Chakravarthi RAJAGOPAL, Senior Scientific Assistant, all of Central Electro-chemical Research Institute, Karaikudi 3, Tamil Nadu, India and all Indian citizens.

This invention relates to improvements in or relating to paint stripper.

Hitherto it has been proposed that old paint has to be removed before repainting is done. It has been proposed by the inventors of the earlier patent (Indian Specification No. 109310) that old paint can be removed by application of paint removing jelly, paint removing jelly to Indian patent No. 109310 removed only air drying paints based on linseed oil and it was open to the objection that this jelly was not able to remove stoved enamels rubber paints and bitumen or coal tar based formulations.

The object of this invention is to obviate this disadvantage and to develop a composition which can remove enamels, rubber paints and coal tar based formulations (Table 1).

To these ends, the invention broadly consist in incorporating a wetting agent eg., sodium lauryl sulphate, lissopol and a thickener eg., ethyl cellulose methyl cellulose, carboxyl ethyl cellulose etc., in a suitable organic solvents, e.g., dichloromethane; trichloroethylene, acetone, benzene, carbon tetrachloride, so that a brushable composition is obtained. The composition is given in Table 2. It is seen from the table that the evaporation loss is low in the developed stripper.

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The following typical examples are given to illustrate the invention.

Example 1

2 grams of sodium lauryl sulphate dissolved in 20 c.c. of water. Then 80 cc of dichloromethane is added and mixed to obtain a foaming viscous liquid. To this solution 1 gram of ethyl cellulose is added and thoroughly mixed to obtain a paint stripper. This composition removes all paints metioned in Table No. 1.

Example 2

1 gram of ethyl cellulose and 2 grams of sodium lauryl sulphate is first mixed in 20 cc of water to obtain a paste than 50 cc of dichloromethane and 30 cc of trichloroethylene are taken and added to the above paste and the whole solution is mixed to obtain a viscous liquid of paint stripper. This composition removes all the paints as mentioned in table 1, except epoxy coal tar.

Example 3

2 grams of sodium lauryl sulphate dissolved in 20 cc of water. Then 80 cc of trichloroethylene is added and mixed to obtain a foaming viscous liquid. To this solution 1 gram of ethyl cellulose is added and thoroughly mixed to obtain a paint stripper. This composition removes chlorinated rubber, bitumen and air drying primers.

The performance characteristics of the developed paint stripper composition No. 5 is compared with commercial paint stripper in the table No. 3. It is seen from the table that stripping time for both commercial and developed paint stripper are same. It is also seen from the last column of table 3, that the surface is free from wax deposition with the developed paint stripper.

TABLE 1

Sl. No.	Paint systems used for stripping	No. of coats applied.	Thickness in mils	Air dried or stoued	No. of days
1	Epoxy coal tar	one	2	Air dried	1 Week
2	Stoving enamel	„	1	Stoved at 120° for 30 minutes	„
3	Chlorinated rubber	„	1.5	Air dried	„
4	Bitumen	„	1.5	„	„
5	Red oxide	„	1.0	„	„

Price: TWO RUPEES.

TABLE 2

Bath Compositions and Evaporation Loss

Sl. No.	Bath composition	Thickener	Wetting Agent	Evaporation in percentage in 60 minutes
1	Dichloromethane . . . . .	..	..	8
2	Trichloroethylene . . . . .	..	..	3
3	Trichloroethylene 80% & 20% water	Ethyl cellulose	Sodium lauryl sulphate	1.1
4	Dichloromethane + Trichloroethylene (1:1) . . . . .	..	..	6
5	Dichloromethane 80% water 20%	Ethyl cellulose	Sodium lauryl sulphate	1.3
6	Dichloromethane — 50% + Trichloroethylene — 30 + % water 20%	Ethyl cellulose	do.	2.1
7	Commercial paint stripper . . . . .	..	..	4

TABLE 3

Performance of Commercial paint Stripper with the developed stripper :

S.No. Paint systems used for stripping	Stripping time in minutes		Surface condition after removal of paint	
	Commercial stripper	Developed stripper No. 5	Commercial	Development
1 Epoxy coal tar	about 30 minutes	about 30 minutes	Leaves behind wax deposition	No. wax deposition (answers water break test)
2 Stoving enamel . . . . .	..	..	..	..
3 Chlorinated rubber	removes instantaneously (within minutes).	removes instantaneously (within minutes)	..	..
4 Bitumen . . . . .	..	..	..	..
5 Red oxide . . . . .	..	..	..	..

ADVANTAGES

- (1) This composition removes stoved enamel coal tar based paints which cannot be removed by Indian Patent No. 109310.
- (2) The composition can be applied by brushing to all types of steel structures.
- (3) The composition remains on the surface wet for about 1 to 1½ hours which is sufficient for removing the paint. The loss due to evaporation is less than that of commercial paint stripper.
- (4) After paint stripping using this composition, the surface is ready for repainting while

in the case of commercial stripper a residual film of wax is left which has to be removed with fresh solvent.

- (5) The evaporation loss of this composition is less than that of commercial stripper.

Dated this 2nd day of May, 1973.

Sd/-

R. BHASKAR PAI
PATENTS OFFICER,
Council of Scientific & Industrial Research,

COMPLETE SPECIFICATION**IMPROVEMENTS IN OR RELATING TO PAINT STRIPPER**

COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH, RAJI MARG, NEW DELHI-1, INDIA, AN INDIAN, REGISTERED BODY INCORPORATED UNDER THE REGISTRATION OF SOCIETIES ACT (ACT XXI OF 1860).

The following specification particularly describes and ascertains the nature of this invention and the manner in which it is to be performed :—

This is an invention by KUMMATTITHIDAL SANTHANAM RAJAGOPALAN, Scientist, SUBBIAH NADAR GURUVIAH, Scientist and CHAKRAVARTHI RAJAGOPAL, Senior Scientific Assistant, all of the Central Electrochemical Research Institute, Karaikudi-3, Tamil Nadu, India, all Indian citizens.

Paint strippers are of three types (a) alkali base (b) acid based and (c) organic solvent based—(a) is injurious to some metals and to materials like wood, (b) requires heating and attack some base metals and (c) rapidly evaporates from the surface and leave behind a waxy film. All the three types are usually applied by immersion.

This invention relates to Improvements in or relating to Paint Stripper.

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Hitherto it has been proposed that old paint has to be removed before repainting is done. It has been proposed by the inventors of the earlier patent (Indian specification No. 109310) that old paint can be removed by application of paint removing jelly, paint removing jelly to Indian patent No. 109310 removed only air drying paints based on linseed oil and it was open to the objection that this jelly was not able to remove stoved enamels rubber paints and bitumen or coal tar based formulations.

The object of this invention is to obviate this disadvantage and to develop a composition which can remove enamels, rubber paints and coal tar based formulations.

The main finding is that organic solvent such as Dichloromethane, trichloroethylene are incorporated with wetting agents like sodium lauryl sulphate, lissopol and thickener like ethyl cellulose, methyl cellulose can remove stoved enamel and coal tar paint which cannot be removed by the paint removing jelly to (Indian Patent No. 109310).

Paints which cannot be removed by paint removing jelly (Patent No. 109310) can be removed.

According to the present invention, there is provided a process for preparing a composition to remove old paint which consists in dissolving a wetting agent such as sodium lauryl sulphate in water, and adding a thickener such as ethyl cellulose and an organic solvent such as dichloromethane.

The proportion ranges of the ingredients are as follows :—

Dichloromethane	70-80%	Ethyl cellulose	1-2%
Water	10-20%	Sodium lauryl sulphate	2-4%

The preferred proportion of ingredients is as follows :—

Dichloromethane	80%	Ethyl cellulose	1%
Water	20%	Sodium lauryl sulphate	2%

The important characteristics are :—

- (1) It does not run off the surface on application by brushing.

- (2) The active substance remains in contact with the paint surface for the period required to remove the old paint.
- (3) Evaporation loss of this composition is less than that of commercial stripper.
- (4) The stripper can be washed of the surface with water.
- (5) It leaves no wax residue after washing as in the case of commercial stripper.

The incorporation of wetting agent (sodium lauryl sulphate) and a thickener (ethyl cellulose) in a suitable organic solvent (dichloro methane) reduces the evaporation loss and makes it possible to remove coal tar and enamel paints. *The product has unique properties not associated with the ingredients and not a mere admixture resulting in the aggregation of the properties of the components of the composition.*

Example 1

2 grams of sodium lauryl sulphate dissolved in 20 c.c. of water. Then 80 c.c. of dichloromethane is added and mixed to obtain a foaming viscous liquid. To this solution 1 gram of ethyl cellulose is added and thoroughly mixed to obtain a paint stripper. This composition removes all paints mentioned in Table No. 2.

Example 2

1 gram of ethyl cellulose and 2 grams of sodium lauryl sulphate is first mixed in 20 c.c. of water to obtain a paste, then 50 c.c. of dichloromethane and 30 c.c. of trichloroethylene are taken and added to the above paste and the whole solution is mixed to obtain a viscous liquid of paint stripper. This composition removes all the paints as mentioned in Table 2, except epoxy coal tar.

Example 3

2 grams of sodium lauryl sulphate dissolved in 20 c.c. of water. Then 80 c.c. of trichloroethylene is added and mixed to obtain a foaming viscous liquid. To this solution 1 gram of ethyl cellulose is added and thoroughly mixed to obtain a paint stripper. This composition removes chlorinated rubber, bitumen and air drying primers.

The performance of paint stripper developed by us is given below in comparison with commercial stripper (Table 3).

A few typical examples to illustrate how the new invention is carried out in actual practice is given in Table 1.

TABLE 1

Bath composition and Evaporation loss :

Sl.No.	Bath composition	Thickener	Wetting Agent	Evaporation in percentage in 60 minutes
1	Dichloromethane . . . . .	..	..	8
2	Trichloroethylene . . . . .	..	..	3
3	Trichloroethylene 20% water	80% & Ethyl cellulose (1%)	Sodium lauryl sulphate (2%)	1.0
4	Dichloromethane + Trichloroethylene (1:1) . . . . .	..	..	6
5	Dichloromethane 80%, water 20%	Ethyl cellulose (1%)	Sodium lauryl sulphate 2%	1.1
6	Commercial paint stripper . . . . .	..	..	4

The paints on which paint stripper is tried are given in table 2 :-

TABLE 2

Sl. No.	Paint systems used for stripping	No. of coats applied	Thickness in mils.	Air dried for one week before test	Stoved at 120° for 30 min., before test.
1	Epoxy coal tar	one	2	Air dried	..
2	Stoving enamel . . . . .	..	1	..	stoved.
3	Chlorinated rubber . . . . .	..	1.5	Air dried	..
4	Bitumen . . . . .	..	1.5	..	..
5	Red oxide . . . . .	..	1.0	..	..

TABLE 3

Performance of Commercial Paint Stripper with the developed stripper

Sl. No.	Paint system used for stripping	Commercial Stripper	Stripping time in minutes		Surface condition after removal of paint	
			Developed stripper No. 5	Commercial	Commercial	Developed
1	Epoxy coal tar	about 30 minutes	about 30 minutes	Leaves behind wax deposition.	No wax deposition (answers water break test)	
2	Stoving enamel. . . . .	..	..	..	..
3	Chlorinated rubber	removes instantaneously	removes instantaneously	..	..
4	Bitumen . . . . .	..	..	..	..
5	Red oxide . . . . .	..	..	..	..

The main advantages of the invention :-

- 1) The evaporation loss is less than the commercial stripper.
- 2) It leaves no wax residue after the removal of paint.

Summary and critical discussion

The invention consists in formulating a viscous substance having sufficient consistency to be brushed with paint brush which has the valuable property of removing coal tar and enamel paint from erected steel structures. Such a cheap product can be formulated using the indigenously available raw-materials.

WE CLAIM:-

(1) A process for preparing a composition to remove old paint which consists in dissolving a wetting agent such as sodium lauryl sulphate in water, and adding a thickener such as ethyl cellulose and an organic solvent such as dichloromethane.

(2) A process as claimed in claim 1 wherein the proportion ranges of the ingredients are as follows :-

Dichloromethane 70-80% Ethyl cellulose 1-2%

Water 10-20% Sodium lauryl sulphate 2-4%

(3) A process as claimed in claim 1 or 2 wherein the proportion of ingredients are as follows:-

Dichloromethane 80% Ethyl cellulose 1%
Water 20% Sodium lauryl sulphate 2%

(4) A process for preparing a composition to remove old paint substantially as herein before described.

Dated this 2nd day of January, 1974.

Sd./-

(R. BHASKAR PAI)

PATENTS OFFICER.

Council of Scientific & Industrial Research