



December 21st, 1939

Mr. Frederick Laist,
Vice-President,
International Smelting and Refining Company,
25 Broadway,
New York City.

Dear Mr. Laist:

not attached
Attached you will find a copy of an
affidavit and a letter to Mr. James W. Laist,
pertaining to application serial No. 178,352.
Under date of December 19th, Mr. James W. Laist
has replied to Mr. Knox so that when you have the
enclosed, you will have a complete file.

Very truly yours

FOC:vlc

cc: Mr. G. E. Johnson

enclosure

N11308

PNYC00008464

A F F I D A V I T

JOHNSON ET AL. APPLICATION
SERIAL NO. 178,352, FOR:
METHOD OF PRODUCING WHITE
LEAD

STATE OF INDIANA)
) SS:
COUNTY OF LAKE)

WILLIAM J. KNOX, JR., one of the above-named petitioners, being duly sworn, deposes and says that the method described in the above application is an improvement over other methods used in the production of White Lead by the electrolytic process for the reasons:-

FIRST - The earlier methods could not be controlled with sufficient precision to produce a product of uniform chemical composition, which in turn led to the production of products of widely varying and uncertain physical composition. The effect, for example, of variations in chemical composition on the important physical property of oil absorption of White Lead when it is used as a paint pigment is shown in the following table. The comparison of the oil absorption or oil taking properties is made by the three methods most commonly used by paint technologists in determining the amount of oil required to produce a paint of brushing consistency.

TABLE NO.1

	Product "A"	Product "B"	Product "C"
Analysis - Percent CO ₂	11.15	11.75	12.40
" PbCO ₃	67.70	71.20	75.30
" Pb(OH) ₂	32.30	28.81	24.80
Primary Oil Absorption (gms/100cc)	13.5	11.5	8.8
Consistency (Stromer-Kröbbs Units 35% oil)	9.2K	9. N	7.4N
Flow (Gardner flow meter, 35% oil)	2.2"	2.75"	3.6"

It can be seen from the foregoing data that a product subject to such wide variation, and mixtures of such products, would be undesirable commercially.

The non-uniformity of the White Lead produced by these earlier methods was due to the lag in the sequence of events involved in the methods of control then employed. These methods were based on regulating the chemical composition of the White Lead by the ratio of carbonate to hydroxide ion contents of the electrolytic cell catholyte. The chain of events involved in this

N11308.01

PNYC00008465

- 2 -

method of control were: - (1) Titration of catholyte at frequent intervals. (2) Adjustment of carbonation fan damper to increase or decrease degree of carbonation of catholyte. (3) Time required to displace old catholyte in storage tanks, piping, and cells by new catholyte of adjusted carbonate-to-hydroxide ratio. (4) Time of adjustment of composition of anolyte by flow of catholyte ions of new ratio from catholyte to anolyte compartment of cell. (5) Time involved in laboratory analysis in checking relationship between ratio and composition of product which was found to vary with changes in cell temperature, rate of flow of cell electrolyte, and other factors.

SECOND - The improvement over the earlier methods by the invention covered in Patent No. 1,845,713 was found to be complicated to operate, due to the necessity of exact neutralization or accurate deficient carbonation of the catholyte. This complication added to the expense, in that additional operating personnel was required to make frequent titrations of the catholyte.

THIRD - That the method of this application has resulted in permitting complete control of the composition of the product and simplification of the operating procedure. Some of the operating improvements that have resulted from the discovery of this new method are listed below:-

(1) Elimination of the time lag from the methods of control by a direct adjustment of the bicarbonate contents of the anolyte. (2) Positive control of the composition of the White Lead by directly controlling the bicarbonate contents of the anolyte. (3) Simplification of control, in that only the one operation of varying the volume of an alkaline solution flowing into the anolyte is involved, and this is accomplished by merely changing the setting on one valve. (4) Complete utilization being made of the discovery that the composition of the White Lead varies directly with the bicarbonate contents of the anolyte.

FOURTH - That this new method of control has greatly decreased the operating cost. Some of these savings are listed below:-

(1) Reduction of cost of required chemicals to a minimum, since in the cases cited, where chemicals are added, these chemicals are less expensive than those used in the methods of reference; and in the case cited where under-carbonated catholyte is used as a source of alkali, no new chemicals are required. (2) Reduction in number of men required to operate the process. For example,

when controlling the operation of a tank room containing forty-eight cells,
by the methods of reference, it required one circulation man, one titration man,
and two cell men; but when operated by the method of this application, only one
circulation man and one cell man is required.

William J. Kux

Subscribed and sworn to before me
this 15 day of December, 1939

Robert C. Malone
Notary Public

My Commission Expires Aug. 3, 1941

WJL/mk 12/15/39

PNYC00008467