

Feb. 2, 1932.

A. WENUSCH

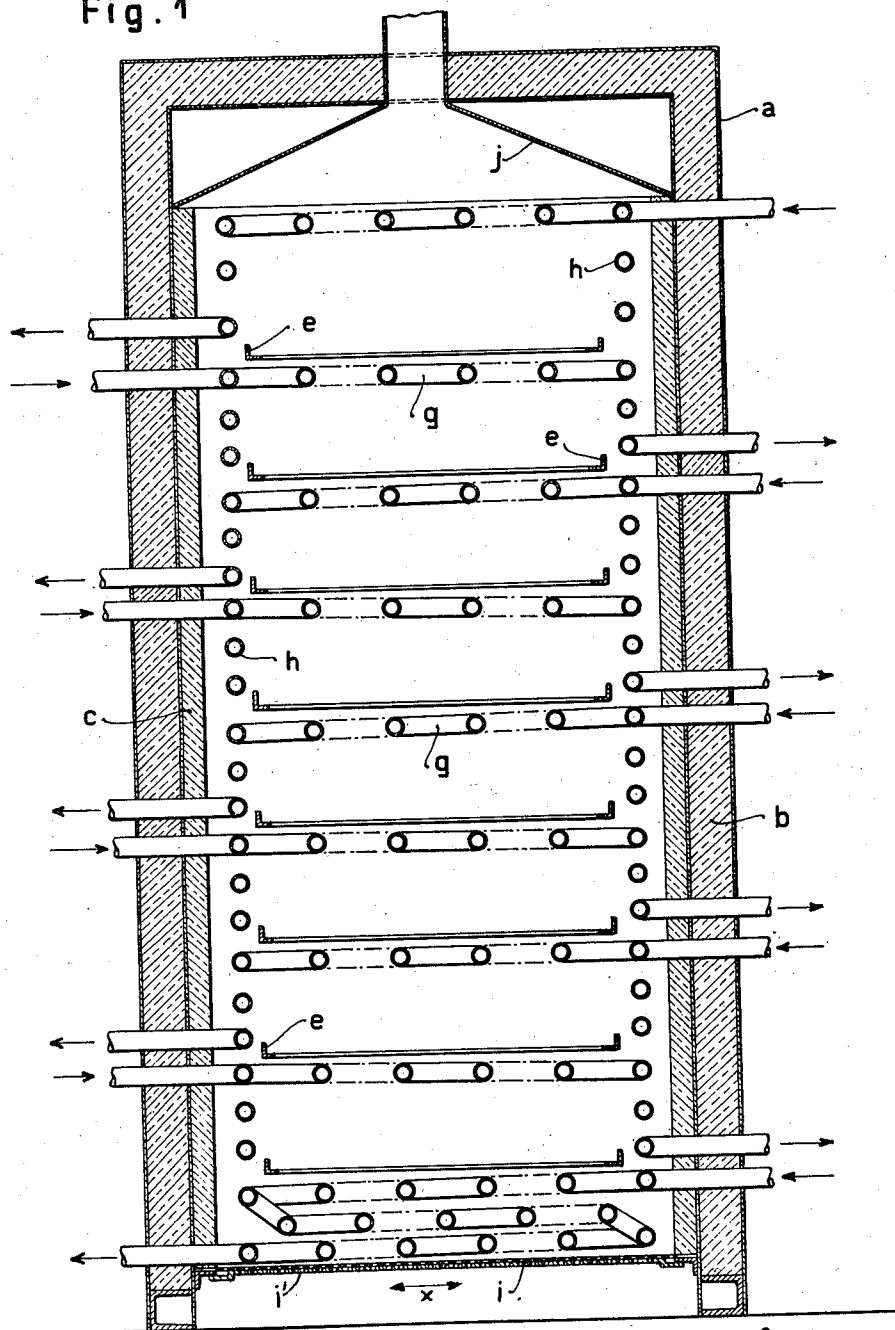
1,843,638

METHOD AND APPARATUS FOR REDUCING THE PERCENTAGE OF NICOTINE
CONTAINED IN RAW TOBACCOS, IN INTERMEDIARY PRODUCTS,
AND IN TOBACCO PRODUCTS READY FOR USE

Filed May 3, 1928

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Fig. 1



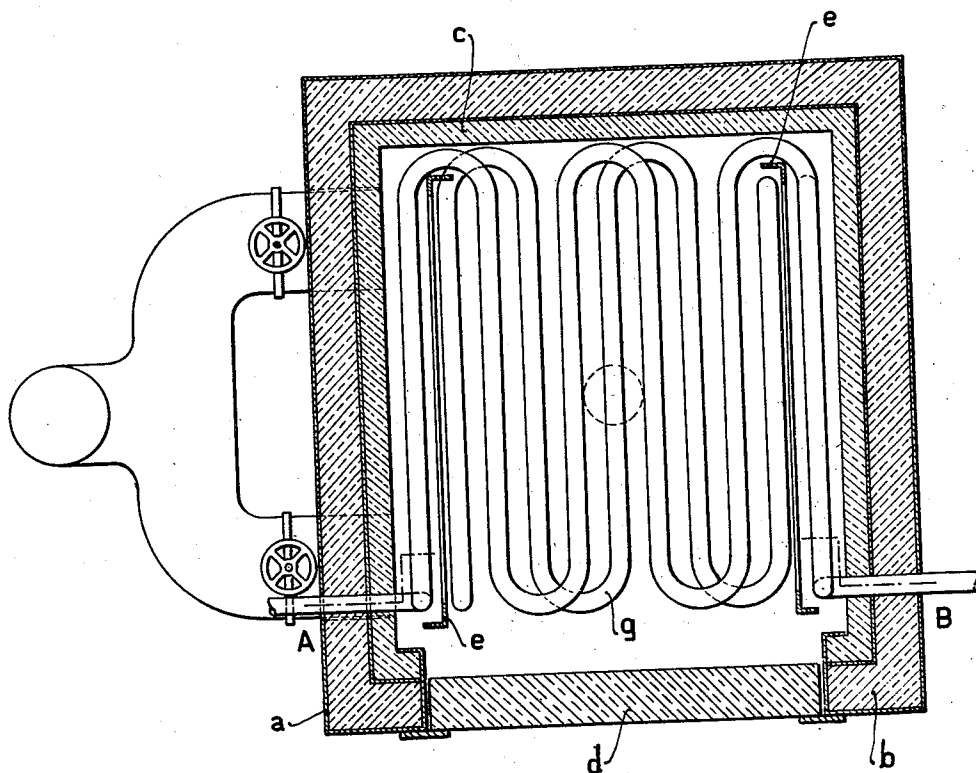
Inventor
Adolf Wenusch/
By *Henry O. R. D.* atty.

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Fig. 2



Inventor
Adolf Menusch
By Henry O. R. J. att.

UNITED STATES PATENT OFFICE

ADOLF WENUSCH, OF VIENNA, AUSTRIA, ASSIGNOR TO OESTERREICHISCHE TABAK
REGIE, OF VIENNA, AUSTRIA, A CORPORATION OF AUSTRIA

METHOD AND APPARATUS FOR REDUCING THE PERCENTAGE OF NICOTINE CONTAINED
IN RAW TOBACCOS, IN INTERMEDIARY PRODUCTS, AND IN TOBACCO PRODUCTS
READY FOR USE

Application filed May 3, 1928, Serial No. 274,867, and in Austria May 9, 1927.

For removing the nicotine out of the tobaccos the present invention makes use of the well known principle of heating the tobacco while passing through it a current of
5 air or steam. According to the present invention this process is carried out in such a manner as to eliminate all factors likely to have a retarding or unfavorable effect and to utilize all propitious influences. By controlling the process in all its phases it is possible to warrant a predetermined degree of
10 loss of nicotine, a feature not realized in any other known process, as the work may be conducted so that the loss of nicotine is
15 simply a function of time.

It has been shown by detailed investigations that by heating tobacco a quite small percentage only of nicotine is driven out owing to its volatility under the action of
20 steam. A considerable reduction of the nicotine can, however, be obtained in a relatively short time if the moisture of tobacco is previously eliminated and a temperature of far above 100° C. is applied. At these
25 temperatures the nicotine escapes owing to the dissociation or sublimation of the nicotine salts chiefly present in the tobacco as malate, citrate etc. If carefully weighed quantities of nicotine salts are heated, perceptible weight losses cannot be observed
30 before a temperature of 130° C. has been attained. As to larger quantities of these salts the spaces of time required for volatilizing at temperatures below 150° C. are far too long
35 for practical use.

That the volatility with steam is actually of no importance in view of the final result may simply be deduced from the fact that the percentage of free nicotine contained in the
40 tobacco is extremely low, whilst no other but free nicotine is volatile with steam. Nicotine chemically bound such as malate, citrate etc. is not at all volatile with steam whilst it is just under the form of the aforesaid salts
45 that the nicotine is almost exclusively present in the tobacco.

The process consists in rapidly heating the tobacco, which should be as dry as possible, to the critical temperature at which the nicotine salts will dissociate and volatilize. At

the same time measures must be taken for the speedy removal of the nicotine salts as well as of the nicotine itself and the temperature must be kept throughout the apparatus on the same level.

By carrying out the process as set forth it is possible without deteriorating the quality of the tobacco to considerably reduce the percentage of nicotine in a relatively short time, the reduction amounting to 50-80% according to the duration of the treatment. As the temperature throughout the apparatus will be the same a uniform reduction of the contents of nicotine is warranted in the whole batch of tobacco. It is possible therefore
65 to reduce f. i. the nicotine percentage of Virginia cigars from 3% to 0.9% and of Portorico cigars from 1.4% to 0.25%.

For carrying out the process any apparatus will suffice which permits of rapidly obtaining a temperature above 150° C. but not above 170° C., and warrants the uniformity of temperature throughout the effective space of the apparatus, taking at the same time provisions to enable the gases to pass rapidly
75 and in uniform distribution through the device.

As the time during which the necessary temperature is to be maintained depend upon the percentage of the desired loss of nicotine, the degree of temperature applied and the kind of tobacco which is treated the following example will illustrate how the process is to be performed.

If oriental tobacco is to be treated and a loss of 50% of its nicotine contents should be attained a temperature of 155° C. will suffice when maintained during about two hours. Higher losses of nicotine desired make necessary a prolongation of time. Cigars are to be treated about two hours at
90 165° C. for reaching a loss of 50% of their nicotine contents.

In general it may be taken that more delicate tobacco should be treated at about 152-155° C., coarser tobacco at higher temperatures.

Burly, Maryland and Ohio fired tobacco is preferably treated during 2½ hours at 160° C., if a loss of 50% of its nicotine contents

is desired. For obtaining higher losses the time of treating may be extended.

The accompanying drawings show an embodiment of such a nicotine extraction device; Fig. 1 representing a vertical section along the line A—B of Fig. 2 and Fig. 2 a cross section through the apparatus.

The wrought iron prismatic casing *a* of the apparatus is provided with insulating layers *b*, *c* consisting of a suitable material so that the interior is well protected against losses by heat radiation. At the narrow side of the casing *a*, there is placed an equally well isolated door *d*, through which the tobacco goods to be freed from nicotine are introduced. The inner sides of the walls of the casing *a* are fitted with the supporting frames *e*, which hold the pans filled with tobacco one above the other. In order to obtain a perfectly uniform heat in the interior of the apparatus a horizontal hot water spiral *g* comprising several coils is located below each pan, a similar vertical hot water spiral *h* being arranged on the long sides of the casing, so that the contents of each pan is not only heated from below but also from the side. By thus locating the hot water pipes and by lining the casing *a* with the heat insulating layers *b*, *c* it has become possible to rapidly raise the temperature of the interior—and therefore also of the tobacco products to be treated—to the height required which can be observed and regulated during the whole extracting process by means of electric long-distance thermometers and thermostatic regulators (not shown in the drawings.)

All hot water spirals belonging to a certain pan—are comprised in a group—being connected to the admission and return pipes of the heating water distribution system by means of shutting off devices, whereby two groups each of the hot water spirals lying one above each other are provided with connections located at opposite sides of the casing. The gas and air currents required to remove the escaping nicotine salts flow upwards in the direction of the longitudinal axis of the casing *a*. A slitted sheet *i* is fastened to the bottom of the casing *a* under the heat water spiral of the lowest pan which spiral is arranged in three planes. Underneath the sheet *i* is provided a similarly slitted sheet *i'* which may be moved relatively to the upper sheet *i* in the direction of the arrow *α*. By these means the slits for the passage of the gas current may be made broader or narrower, as desired, so as to accurately regulate the gas distribution in the interior of the apparatus. On the top of the apparatus there is located an exhaust pipe *j* provided with an adjustable regulating flap valve permitting the discharge of the air or the gases which have entered into the casing through the slits in the sheets *i*, *i'* and carry the nico-

tine salts. Of course electric energy may be used instead of hot water for heating the apparatus, the electric heating bodies being distributed similarly to the heat water spirals and each group being regulated to the temperature desired by means of a thermostatic regulator.

After filling the apparatus, the heating device is adjusted to the temperature desired and then a strong current of air, of dry steam or of an inert gas—preheated to the temperature of the apparatus—is passed through. This temperature is kept constant until the desired loss of nicotine, which as mentioned before is determined by the duration of the process, has been attained.

What I claim is:—

1. The process of treating raw tobacco, intermediary products and tobacco products ready for use to reduce their nicotine percentage, which comprises drying the same, heating the dried goods as rapidly as possible in a suitable apparatus up to a temperature of above 150° C. and below 170° C., uniformly maintaining the goods at that temperature within every part of the whole apparatus during a period of from half an hour to three and a half hours, and simultaneously passing a continuous rapid current of hot gas, preheated to the temperature of the apparatus, through the same so as to rapidly carry away the developed nicotine vapours from the goods.

2. An apparatus for treating raw tobacco and tobacco products, comprising a prismatic casing, a heat insulating lining in the casing, said casing being provided with openings enabling a current of hot gas to pass through the interior of said casing, pans in the casing arranged one above the other and adapted to be axially passed through by said current, an adjustable slitted sheet forming the bottom of the casing adapted to uniformly distribute the gas stream, and groups of heating bodies arranged below each pan and laterally of the casing, so as to surround each of the said pans.

In testimony that I claim the foregoing as my invention, I have signed my name.

ADOLF WENUSCH.