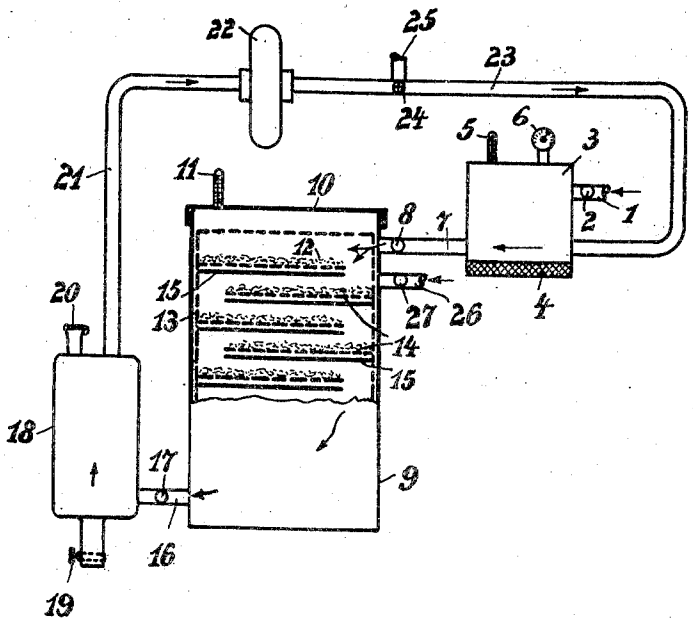
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REMOVING NICOTINE FROM TOBACCO

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REMOVING NICOTINE FROM TOBACCO.

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My invention refers to means for removing nicotine from tobacco, including all sorts of tobacco products. It is an object of my invention to provide means whereby this removal can be effected at comparatively low temperature and without the tobacco being brought in contact with moist or wet reagents which might impair its taste and outer appearance.

My invention substantially consists in treating the tobacco with ammonia gas to remove the nicotine, this treatment being followed by a treatment with means such as carbon dioxide which will interact with the ammonia to form a highly volatile compound such as carbamic acid NH_2COOH, which volatilizes already at a very low temperature. I am aware that it is old to treat tobacco with ammonia in order to remove the nicotine therefrom. However this treatment has hitherto been conducted at comparatively high temperature, and it has never been possible to remove the ammonia altogether, so that the taste and appearance of the tobacco thus treated were invariably changed by this treatment and the tobacco, when enclosed in a tin box or the like, would emit on the box being opened, evil smelling ammonia.

These drawbacks are overcome according to the present invention by the subsequent treatment with carbon dioxide, whereby all ammonia still present is converted into the highly volatile carbamic acid, which has no smell of its own and moreover disappears readily by volatilization.

My invention is illustrated in the drawings affixed to the specification and forming part thereof, which show diagrammatically by way of example an apparatus adapted for use in carrying my invention into effect.

Referring to the drawings, 1 is a pipe having a valve 2 inserted therein and leading to a source of ammonia gas, such as a bottle filled with ammonia. 3 is a vessel and 4 is an electrical heating resistance serving to heat the vessel to a low temperature, for instance slightly above 42° C. At this temperature the plasma cells of the tobacco leaves, with which the nicotine is combined, are destroyed and the nicotine is set free. 5 is a thermometer, and 6 a manometer mounted on the vessel 3. 7 is a pipe leading from the vessel to the upper part of a chamber 9, in which the nicotine is removed from the tobacco. 8 is a valve inserted in pipe 7. 10 is a cover closing the chamber 9, and 11 is a thermometer mounted in the cover. 12 is the tobacco, which is spread on wire screens 14 disposed in staggered relation on a wire structure 13, a sheet metal plate 15 extending below each screen 14 and serving for retaining any impurities which may be carried along by the ammonia.

From the bottom part of chamber 9 a pipe 16 with a valve 17 inserted therein leads to the washer 18, which is filled with a suitable washing or purifying liquid such as trichlorethylene C_2HCl_3 or carbon tetrachloride CCl_4. A tap cock 19 is mounted in the bottom end of the washer 18 and a funnel 20 is mounted on the top of the washer for refilling same. From the top portion of the washer 18 a pipe 21 leads to a fan or blower 22 which is connected by a pipe 23 with the vessel 3, thereby closing the circuit for the ammonia gas. In pipe 23 is inserted a two-way cock 24 which connects pipe 23 with a branch pipe 25 leading into the open air.

Another branch pipe 26 with a valve 27 inserted therein is mounted in the side wall of chamber 9 and leads to a source of carbon dioxide, such as a steel cylinder filled therewith.

The operation of this apparatus is as follows:

On the heating resistance 4 being supplied with current, valve 2 is opened, thereby allowing ammonia to enter the vessel 3. At the same time valve 24 is set to connect pipe 23 with branch pipe 25 and the fan 22 is set rotating, whereby all the air in the apparatus is expelled through pipe 25, ammonia gas being sucked into the vessel 3 through pipe 1. Valve 24 is now turned to close pipe 25 and ammonia gas now flows through vessel 3, pipe 7, chamber 9, pipe 16, washer 18, wherein the nicotine is separated out, pipe 21, fan 22, and pipe 23, back to the vessel 3.

After the apparatus has filled with ammonia, valve 2 is closed and the same quantity of ammonia is now constantly pumped through the apparatus in a closed cycle, continuously removing nicotine from the tobacco spread on the shelves in chamber 9 and allowing it to be absorbed by the liquid in the washer 18. The ammonia is allowed to circulate in a closed cycle for some hours, the temperature required for the extraction being maintained by means of the heating resistance 4. The average pressure in the apparatus is preferably only slightly higher than the atmospheric pressure.

After the operation has come to an end, the valves 8 and 17 are closed, whereby the cham-

ber 9 is cut out and fan 22 is brought to a standstill. Now carbonic acid is allowed to enter chamber 9 through pipe 26 and combines with the ammonia in the chamber 9 to form the innocuous and highly volatile carbamic acid.

The cover 10 is now removed and the shelves with the tobacco deprived of nicotine can be removed also.

I have found that in treating tobacco containing more than one per cent nicotine in the manner aforesaid, four-fifths of the nicotine are removed, the tobacco only having a content of 0,2 per cent nicotine.

Various changes may be made in the details disclosed in the foregoing specification without departing from the invention or sacrificing the advantages thereof.

I claim:—

1. The method of removing nicotine from tobacco comprising acting on the tobacco at a low temperature first with ammonia and and thereafter with a substance adapted to combine with ammonia to form an inodorous, highly volatile compound.

2. The method of removing nicotine from tobacco comprising acting on the tobacco at a low temperature first with ammonia and thereafter with a substance adapted to combine with ammonia to form carbamic acid.

3. The method of removing nicotine from tobacco, comprising acting on the tobacco at a low temperature first with ammonia and thereafter with carbon dioxide.

4. The method of removing nicotine from tobacco comprising acting on the tobacco at a temperature slightly above 42° C. first with ammonia and thereafter with a substance adapted to combine with ammonia to form an inordorous, highly volatile compound.

5. The method of removing nicotine from tobacco comprising acting on the tobacco at a low temperature and in a closed cycle first with ammonia and thereafter with a substance adapted to combine with ammonia to form an inodorous, highly volatile compound.

6. The method of removing nicotine from tobacco comprising circulating in contact with the tobacco a current of ammonia gas heated slightly above 42° C., until most of the nicotine has been extracted, and thereafter converting such ammonia into carbamic acid.

7. The method of removing nicotine from tobacco comprising circulating in contact with the tobacco a current of ammonia gas heated slightly above 42° C., until most of the nicotine has been extracted, and thereafter acting on said ammonia with carbon dioxide to form carbamic acid.

8. The method of removing nicotine from tobacco comprising circulating in contact with the tobacco and thereafter through a body of a nicotine solvent a current of ammonia gas heated slightly above 42° C., until most of the nicotine has been extracted and thereafter converting such ammonia into carbamic acid.

In testimony whereof I affix my signature.

HUGO FEDERMANN.