Aug. 25, 1959 F. PIETRUSKA 2,900,986

MOISTENING OF TOBACCO

Filed Sept. 11, 1956 2 Sheets-Sheet 1

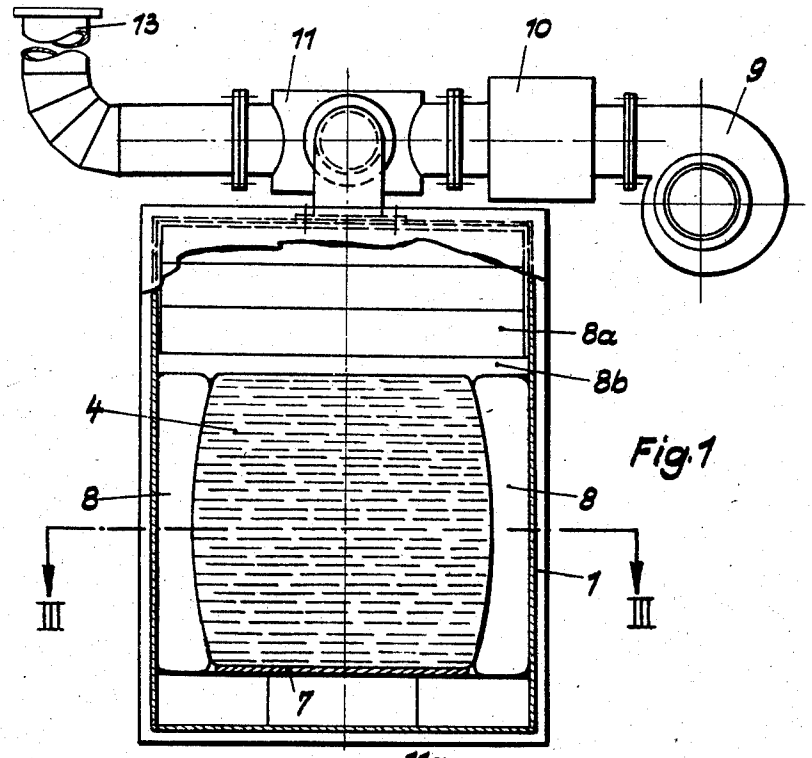


Fig. 1

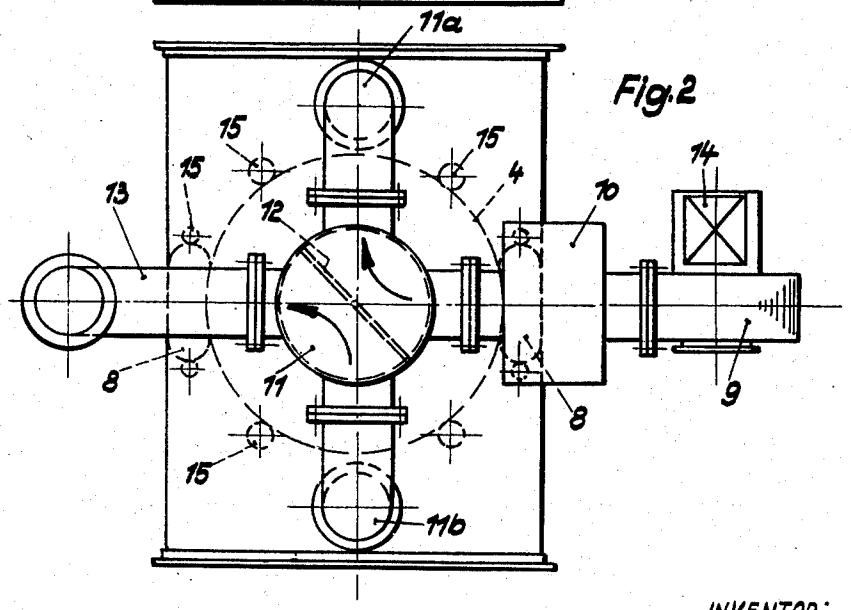


Fig. 2

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Filed Sept. 11. 1956 2 Sheets-Sheet 2

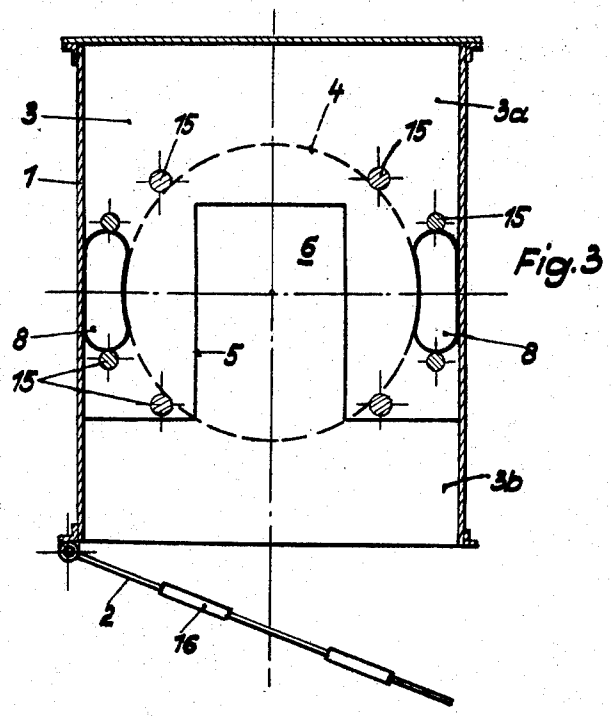


Fig. 3

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MOISTENING OF TOBACCO

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2 Claims. (Cl. 131—134)

The present invention relates to the moistening of tobacco, more particularly of laminated tobacco compacts. Tobacco in this form is dry and somewhat brittle. Therefore, it must be thoroughly moistened before it can be processed further. This moistening is necessary to enable the tobacco compact to be disintegrated into bunches and/or leaves without breaking, if possible, for the further processing of said bunches and leaves.

Many types of apparatus are known for moistening dry compacts or bunches of tobacco. One feature which is common to them is the use of moist, warm air or of steam, which acts on the material to be moistened for a period of varying duration. In most cases a high vacuum is applied to enable the moist air or steam to penetrate into the hard, dry tobacco compact, also called "tobacco stock." Another known construction uses steam under higher pressure or humidified compressed or a mixture of both and feeds the moistening agent into the interior of the tobacco stocks by pipes axially driven into the same.

The moistening of tobacco does not only give rise to difficulties of mechanical character, because it is difficult to uniformly moisten a firmly compressed dry body without forcibly loosening—this would cause breaking of the leaves and produce an excess of fines—but is a problem also because the flavour of more valuable tobacco will be impaired if a certain temperature and a certain time of treatment are exceeded. For some tobaccos the limiting values above which such damage occurs lie much below the values which should be observed in order to reduce the time of treatment and obtain a uniformly moistened material. In tobaccos in which no damage to the flavour needs to be feared even when they are treated with moisture at an elevated temperature and which can be moistened efficiently only at high temperatures the two moistening processes described hereinbefore have been employed so far. The use of a vacuum during the moistening treatment however, requires the construction of very expensive chambers, which must withstand the outer superatmospheric pressure of almost 1 kg./sq. cm. When steam or moist air are introduced into the interior of the tobacco stock an undesired fracturing results from the driving of the feed pipes described.

As contrasted with the known apparatus and processes the invention provides for enriching the fan-circulated air at a suitable point with steam and water, whereafter the air flows through the stock under the pressure imparted to it by the fan. Even in normally compressed barrels that pressure need not exceed about 400 mm. liquid column. To make this possible at the relatively low superatmospheric pressures mentioned, the tobacco compact is inserted as a partition between two spaces which may be subjected to different internal pressures in such a manner that the layers of the partition extend in the direction connecting these two spaces and that a connection between these spaces is possible only through but not around the tobacco body.

The apparatus according to the invention comprises a moistening chamber for receiving the tobacco compact and supports for the same and is characterized in that the chamber is provided with sealing means which adapt themselves to the size of the tobacco compact and are effective between the same and the chamber wall, with which they cooperate to divide the interior of the chamber into an air supply space and an air discharge space, said chamber being further provided with a moist-air inlet and an air outlet, which can be selectively and reversibly connected to said spaces, respectively.

To explain the invention and additional features thereof with more detail, reference is to be had to the accompanying drawings, in which

Fig. 1 is a vertical sectional view of a moistening chamber according to the invention. Fig. 2 is a top plan view showing the chamber and the line I—I on which the sectional view of Fig. 1 is taken. Fig. 3 is a sectional view taken on line III—III of Fig. 1.

The moistening chamber comprises a shell **1**, suitably of stiffened sheet metal, with a door **2** which can be closed to seal the moistening chamber **3** with the aid of a suitable gasket (not shown). The moistening chamber **3** accommodates the tobacco compact **4** resting on a step **5**. In the present case the tobacco compact **4** consists of barrel tobacco, which has approximately the form shown. The step **5** has a recess **6** opposite to the door opening in order to facilitate the deposition of the tobacco compact, which is supplied on a lift truck. To avoid the tobacco compact from settling down into the depression **6**, as might occur as the compact absorbs moisture and is increasingly softened, it is recommended to deposit the tobacco compact together with the barrel end wall **7** on the step **5**.

Sealing inserts **8** are provided between the tobacco body **4** and the wall **1** of the moistener. The same consist of heat-treating inflatable bodies of rubber, rubber impregnated linen, suitable plastics or the like, or may simply consist of flaps. Another sealing interlayer **8***a* is provided above the bale but can be omitted if the bale fills the entire height of the chamber. This upper sealing insert may consist of any suitable stiff partition which applies with resilient gaskets **8***b* against the top of the bale, the top of the bodies **8** and the walls **1**.

The inserts **8**, **8***a* and **8***b* form together with the tobacco compact **4** a partition whereby the moistening chamber **3** is divided into two parts **3***a* and **3***b*. If different pressures prevail in the sub-chambers **3***a* and **3***b*, the air contained in said sub-chambers will tend to pass through the barrel shaped tobacco stock in order to equalize the pressure. If this air is appropriately moistened that pressure difference will cause a moistening of the tobacco. This pressure difference may be permanently maintained by suitable exhaust fans or the like to adapt the degree of moistening to practical requirements.

It is apparent that the pressure difference required for moistening the tobacco compact will be the less, the less is the resistance encountered by the moist air as it flows through the tobacco compact. This resistance will be much smaller if the flow is parallel to the tobacco leaves than if it is at right angles thereto.

To obtain the pressure difference between the spaces **3***a* and **3***b*, one of these spaces is connected to a fan **9**, which produces a superatmospheric pressure in the space next to it. A conditioning device **10** is connected in series behind the fan **9** for heating and moistening the air as desired. The fan feeds the air through the device **10** into a manifold **11**, in which a flap **12**, which can be turned to either of two positions, passes the air either first into the space **3***a* or into the space **3***b*, whereas the partially dried air emerging from the space of lower pressure is discharged on the other side of flap **12** by a discharge line

13. According to the illustrated embodiment, the air enters first into the space 3*a*, from where it passes through the tobacco compact and is then discharged from the space 3*b*. If the flap **12** was turned through 90 deg. the air stream would flow in the opposite direction. **11***a*, **11***b* are pipes which connect the manifold **11** to the spaces 3*a*, 3*b*. **14** indicates the drive motor of the ventilator **9**. To enable cyclic operation the discharge line **13** could lead back to the suction pipe of the ventilator **9**, in a manner known per se.

Supports **15**, e.g. rods, which may be removably fixed at the bottom and top of the moistening chamber, may be provided to prevent a displacement of the tobacco bale **4** or of the air bags **8** under the action of the pressure difference.

The direction of flow of the moist air is repeatedly reversed by operating the flap **12**, in order to obtain a more uniform moistening. The condition of the tobacco can be observed through the window **16** provided in the door **2**. The duration of the action of the moist air, however, will be mainly determined in accordance with empirical data and depends on the size of the tobacco compact, its residual moisture content before the moistening and its origin.

As has been mentioned, relatively small pressure differences are sufficient in carrying out the process according to the invention. This is a great advantage not only from the construction aspect but also from thermal considerations because the generation of high vacuums as are necessary in the so-called vacuum moisteners requires steam injectors in most cases. To produce a great reduction in pressure such injectors must be operated with valuable high-pressure steam, which is not always available. If there is no source of steam at all such vacuum moistener can be operated only with an auxiliary boiler. Such complicated auxiliaries are not required in the present case. Where wet steam is available it may be used for conditioning the moistening air; in the absence of wet steam a simple conditioning device is employed.

What I claim is:

1. An apparatus for moistening tobacco compacts consisting of pressed layers of tobacco leaves, comprising in combination: a closed housing defining a moistening chamber, means in said housing for supporting the tobacco compact in said moistening chamber, sealing members in said housing and arranged to define a zone for receiving the compact, said sealing members being adapted to conform to the contour of the compact and forming together with the compact a partition dividing the moistening chamber into two compartments, said sealing members restricting fluid flow between the compartments to the zone occupied by the compact, said zone being symmetrical about a center line whereby a symmetrical compact placed therein may have symmetrical portions each extending into a respective one of said compartments, means for maintaining different pressures in said compartments, means for introducing moist air into one of said compartments, means for exhausting air from the other one of said compartments, whereby a moist air stream is produced between said two compartments and through said compact, the compact supporting means being arranged to support the compact with its layers parallel to the direction of flow of said air stream, and adjustable means for selectively connecting the two compartments with the air introducing and air exhausting means, respectively, thereby to reverse the direction of flow of the air stream.

2. The apparatus of claim 1 wherein each sealing member is an inflatable resilient air receptacle which is mounted between a respective wall of the housing and the tobacco compact.

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