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METHOD OF PRODUCING A FIBROUS TOBACCO MATERIAL FOR CIGARETTES

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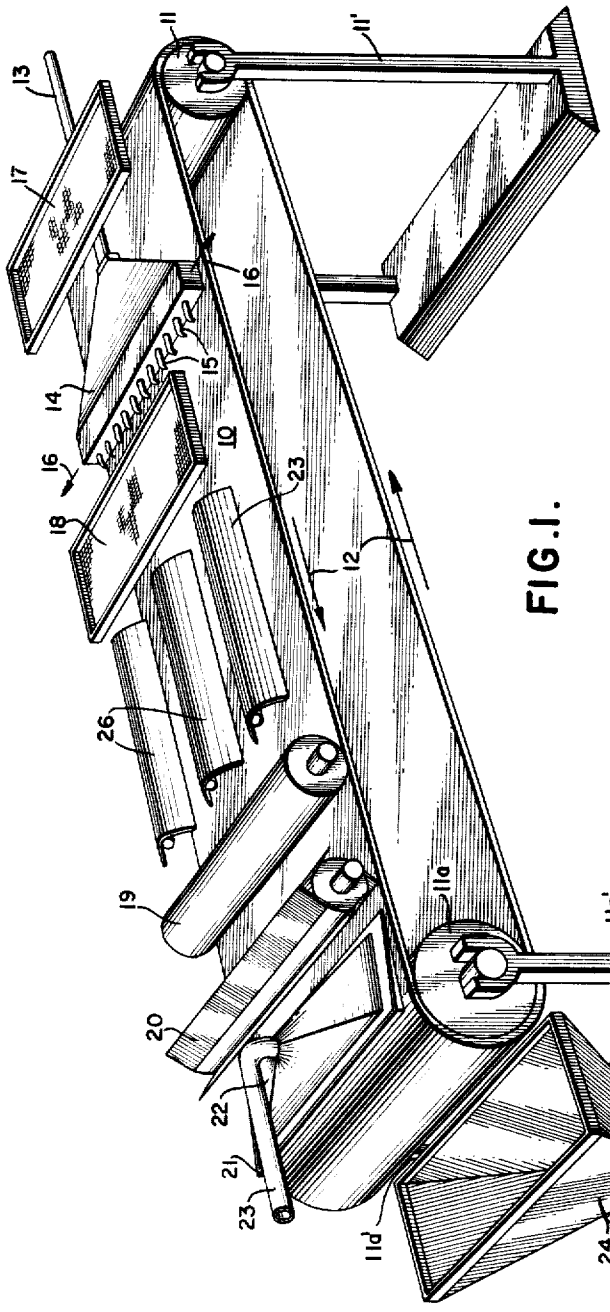

FIG. 1.

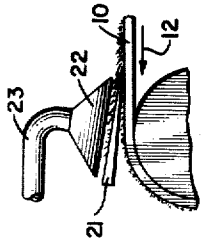

FIG. 2.

INVENTOR
Franz Muth

BY George H. Spencer
ATTORNEY

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METHOD OF PRODUCING A FIBROUS TOBACCO MATERIAL FOR CIGARETTES

Franz Muth, Hamburg-Blankenese, Germany, assignor to H. F. & Ph. F. Reemtsma, Hamburg-Grossflottbek, Germany, a corporation of Germany

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13 Claims. (Cl. 131—140)

The present invention relates to a method of producing a fibrous tobacco material for cigarettes.

It is the principal object of the present invention to produce a fibrous tobacco material which fully corresponds to natural tobacco insofar as its aroma and burning properties are concerned, and which contains in each particle as produced substantially all components of the tobacco mixture of a cigarette so that these components will be present in each individual particle of the entire material and at any cross-sectional area of the cigarette, and the taste and flavor of the burning cigarette and the rate of consumption thereof will be absolutely uniform. This object has never been fully attained prior to this invention by the known methods of mixing the tobacco leaves of the different components by mechanical means, which was due particularly to the fact that at least some of the components only constituted a very small percentage of the entire mixture.

It has already been frequently proposed, particularly for utilizing tobacco waste, to apply such waste in a finely ground condition upon a carrier substance which also consists of a slow-burning material and does not affect the taste of the tobacco smoke, and thus to produce foils which are subsequently cut to the required length and width of the particles. It is however, not possible by this method to produce particles which corresponds to particles resulting from subdividing natural tobacco leaves suitable for smoking insofar as their outer appearance and smoking properties are concerned, and it is impossible thus to produce a cigarette containing an absolutely uniform mixture of the tobacco components at all points.

It is, therefore, an object of the present invention to provide a method of making artificial tobacco particles which are similar in appearance and smoking qualities to particles resulting from subdividing natural tobacco leaves suitable for smoking, each of these artificial tobacco particles containing all of the components of a tobacco mixture of which a cigarette of the same taste characteristics and made of natural tobacco is produced.

Accordingly, the present invention resides in a method of making tobacco material in which a mixture of tobacco and a spinnable carrier substance are sprayed onto a moving belt which has previously been coated with tobacco powder. The carrier substance may be any suitable substance of the type well known in the art, as, for example, methyl ether of cellulose, ethyl ether of cellulose, or gelatine or polyvinyl acohol which are typical materials referred to in U.S. Patent No. 2,433,877. The mixture is so sprayed as to form threads having a cross section substantially of the same size as the cross section of particles resulting from subdividing natural tobacco leaves suitable for smoking. For the purpose of the present invention, it is immaterial whether the initial mixture is produced by first disintegrating natural tobacco into a tobacco powder or by extracting the aromatic substances from natural substances.

It is a particular feature of the present invention that by applying a coating of tobacco powder onto the conveyor belt before the fibrous mixture is sprayed, it will be easier for the threads which are deposited onto the belt to be removed therefrom, such as by scraping, after the threads have been hardened by a curing step, such as a heat treatment. The threads can thereafter be cut transversely to the usual length of tobacco particles, as, for example, to a length of 30 mm.

A special feature of the invention consists in inclining the endless belt which forms the supporting surface, in a downward direction to such an angle that the tobacco powder which does not adhere to the threads will slide by its own gravity away from the areas between the individual threads and along the moving belt, whereupon at the point of reversal of the belt it will be collected to be reused for the subsequent dusting of the belt.

Since the threads after being sprayed on the dust-coated belt have a substantially round cross section which corresponds to the particles to be produced only insofar as the cross-sectional area is concerned, it constitutes another feature of the invention that, before being removed from the belt, these round threads are flattened by means of a roller which is mounted above the moving belt. By adjusting the roller relative to the belt so that the gap between them has the proper width, the cross-sectional shape of the paricles will then be changed to have the width of the desired particles.

In order to prevent the threads from adhering to the rollers, they will, before solidifying, also be dusted with tobacco powder at a point near the place where they are deposited from the nozzles on the moving belt.

This operation as well as that of applying the tobacco powder on the moving belt before the threads are deposited thereon may be varied and controlled individually as well as in their relation to each other so as further to affect the properties of the particles.

The tobacco powder used for this purpose may consist of the same grade of material which is used for producing the particles themselves. However, the smoking qualities of the tobacco may be affected and improved if the tobacco powder used for dusting the particles is produced from a different type of tobacco, for example, one of a very high grade, so that the properties of the particles affecting the smoke taste will be superficially blended and improved. Naturally, it is also possible to use a tobacco for this purpose which is of a poorer grade, less aromatic, and merely serves for preventing the particles from adhering to the belt and flattening rollers.

For attaining the desired cross-sectional size and shape of the threads, it has been found to be of a special advantage if the discharge point of the nozzles is placed as closely as possible above the moving belt, since an undesirable premature solidification of the sprayed material will thus be avoided.

If desired, one may subject the moving belt to suitable transverse movements in order to crinkle the particles similar to particles resulting from subdividing natural tobacco leaves suitable for smoking.

The length of time of the solidification of the threads and thus also the required length of the endless moving belt may be shortened and the curing maturing process be controlled by subjecting the threads in their course of travel to a heat treatment.

The tobacco material produced according to the invention has a greater volume per unit weight than the particles resulting from subdividing natural tobacco leaves suitable for smoking. This has the special advantage that the total weight of the contents of a cigarette may be reduced as compared to the weight of a cigarette filled with natural tobacco particles. This, however, will not shorten the smoking period of the cigarette since the uniformity of the burning process as a result of the uniform flow of indrawn air around each individual particle produces a lengthening effect.

The amount of carrier substance required for preparing the spinnable paste is very small and amounts to only 5 to 10% of the weight of the tobacco, that is,

to an amount which is far below that regarded as admissable under the food and drug acts of the various civilized countries.

The ash formed in smoking on a cigarette produced from the fibrous material according to the invention is entirely free of any unburned carbon. This means, that absolutely no smoldering processes occur which would result in undesirable smoldering products, but that the aromatic ingredients of the tobacco will be taken up by the smoke at low temperatures and without any decomposition characteristics.

In the accompanying drawing, FIGURE 1 is a perspective view of an arrangement for carrying out the process according to the present invention, with FIGURE 2 being a fragmentary elevational view of a detail.

Referring now to the drawings, FIGURE 1 shows a conveyor belt **10** which runs about two rollers **11** and **11***a*, one of which is connected to a suitable driving motor (not shown) to move the band in the direction of the arrows **12**. The rollers are supported by supports **11'** and **11***a'*, respectively, the former being higher so that the belt is downwardly inclined to the left, as viewed in FIGURE 1. A pasty mixture made up of tobacco material and a spinnable and slow-burning carrier substance is supplied from a conduit **13** to a nozzle **14** which is provided with a plurality of openings **15** extending across the width of the belt **10** and extrudes the threads onto the belt **10**, this nozzle being laterally displaceable in the direction of the arrows **16**. Ahead of this nozzle **14**, there is a screen **17** containing tobacco powder. This screen is vibrated by any suitable means (not shown) so that the belt **10** will be coated with tobacco powder.

A second screen **18** is arranged at a point closely adjacent to the point where the threads are extruded onto the belt **10**, i.e., close to the nozzle **14**. This second screen **18** serves to apply tobacco powder onto the previously extruded threads.

The material on the belt is then pressed by a roller **19** and cut by a cutting roller **20**, the cut threads then being scraped off the belt by a scraper **21** from which a suction funnel **22** picks up the threads and leads them to the cigarette making machine (not shown) via the suction conduit **23**. As is best shown in FIGURE 2, the threads are separated from the belt **10** proper by a thin layer of tobacco powder, thereby making possible the scraping off of the threads. The unused tobacco powder, i.e., so much of the powder which does not adhere to any of the threads, will pass beneath the scraper and drop into a receiving funnel **24** from whence it is led, via a conduit **25**, to a salvage container (not shown), thereby allowing the unused tobacco particles to be re-used. Thanks to the downward inclination of the belt **10**, the tobacco particles which do not adhere to the threads will, under the influence of gravity, slide along the belt, as explained above.

In order to shorten the solidification time of the extruded material and to control the curing process, suitable heat treatment may be carried out, as, for example, by heat lamps **26** arranged above the belt **10**. Additional heat lamps (not shown) may be arranged between the rollers **19** and **20**.

Although my invention has been illustrated and described with reference to the preferred embodiments thereof, I wish to have it understood that it is in no way limited to the details of such embodiments, but is capable of numerous modifications within the scope of the appended claims.

Having thus fully disclosed my invention, what I claim is:

1. In a method of producing thin strands from which there can be made particles having the characteristics of particles resulting from subdividing natural tobacco leaves suitable for smoking, the steps of:

(*a*) applying a thin coating of tobacco powder upon a moving surface, and

(*b*) thereafter extruding onto the coating on said moving surface a pasty thread made from a mixture of tobacco material and a spinnable and slow-burning carrier substance so that the thread will contact the tobacco particles which make up the coating while such thread is not yet in solidified form so as to form a thread to all portions of whose outer surface the tobacco particles can adhere, which thread has a cross-sectional area the size of which is substantially equal to the size of the cross-sectional area of particles resulting from subdividing natural tobacco leaves for smoking.

2. A method as defined in claim 1, wherein said moving surface is downwardly inclined to such an extent that the tobacco powder applied thereon and not consumed by engagement with said extruded threads will slide by its own gravity downwardly along and then off said surface for subsequent reuse for the same purpose.

3. A method as defined in claim 1, further comprising the step of applying a thin coating of tobacco powder from above upon the extruded threads.

4. A method as defined in claim 3, wherein said coating of tobacco powder is applied upon the extruded threads at a point closely adjacent to the point where said threads are extruded on said moving surface.

5. A method as defined in claim 3, further comprising the step of flattening said threads to the width of particles resulting from subdividing natural tobacco leaves suitable for smoking by rolling the same after becoming partly solidified during their movement along said moving surface but while still in a deformable condition.

6. A method as defined in claim 5, further comprising the step of cutting said threads to the average length of particles resulting from subdividing natural tobacco leaves suitable for smoking, the latter being between 20 mm. and 35 mm.

7. A method as defined in claim 3, wherein said coating applied upon said moving surface prior to extruding said threads thereon and said coating applied upon said threads after being extruded consist of a tobacco powder having substantially the same composition as the material which is contained in said threads.

8. A method as defined in claim 3, wherein said coating applied upon said moving surface prior to extruding said threads thereon and said coating applied upon said threads after being extruded consists of a tobacco powder of a higher grade of tobacco than the material of which said threads are formed.

9. A method as defined in claim 1, wherein said extruding nozzles are disposed closely above said moving surface.

10. A method as defined in claim 1 further comprising the step of subjecting said extruded threads to a heat treatment while moving along said moving surface.

11. A method as defined in claim 1, wherein said carrier substance constitutes an amount of substantially 5 to 10% of said extruded mass.

12. A method as defined in claim 1, wherein said mixture is produced by disintegrating natural tobacco into a tobacco powder, and mixing the powder particles first with each other and thereafter with said carrier substance.

13. A method as defined in claim 1, wherein said mixture is produced by extracting the aromatic substances from natural substances, and mixing the extracted substances first with each other and thereafter with said carrier substance.

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