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(54) **Cigarette filter rod, method and apparatus for producing the same.**

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Description

BACKGROUND OF THE INVENTION

The present invention relates to a cigarette filter rod for a paper filter attached to a tip end of a cigarette, and its producing method and apparatus. (see GB-A-1 250 170).

In general, the filters to be attached to ends of cigarettes are categorized into a paper filter type using paper (i.e., pure pulp) as a filter material and an acetate filter type using acetate fiber as a filter material.

In such a paper filter type and a acetate filter type, there is a type in which active charcoal particles are mixed into a filter for deodorizing odor of cigarettes.

The following means are used as means for mixing active charcoal particles into a filter according to the conventional technique:

- i) Means for simply diffusing the active charcoal particles into the acetate filter material; and
- ii) Means for attaching the active charcoal particles to the paper filter material after application of binders to the paper filter material. In this case, there are two kinds of process in which after the filter material has been fed from its original roll, the binder is applied thereto and then the active charcoal particles are attached thereto and in which, on the other hand, it is possible to use an original roll of filter material which has been subjected to the active charcoal filter in advance. In any case, it is necessary to apply the binder to the paper filter material.

However, these means suffer from the following difficulties:

The means i) is used for the acetate filter material but is not applicable to the paper filter material. In general, after the diffusion or spreading of the active charcoal particles, the filter material is throttled into a thin rod shape and then the subsequent step of lapping the filter material with the paper. However, in the case of the paper filter material, in the step of throttling the material into the thin rod, the active charcoal particles would be dispersed away from the filter material. Also, if the feeding rate of the filter material would be increased, the active charcoal particles would be dispersed due to the feeding operation of the filter material. In other words, if the feeding rate would be increased, the dispersion of the active charcoal particles would be further accelerated.

On the other hand, in the case of the acetate filter material, the applied or diffused active charcoal particles are retained on the acetate fibers. For this reason, there is no dispersion problem of the active charcoal particles.

Turning to the means ii), the binders applied to the paper filter material would be attached to the surfaces of the active charcoal particles to considerably reduce the deodorising effect of the active charcoal particles.

SUMMARY OF THE INVENTION

Accordingly, a primary object of the invention is to overcome the above-noted difficulties inherent in the prior art.

Another object of the invention is to provide a cigarette filter producing technique that does not reduce the deodorant effect of the active charcoal particles and the flavor effect of the flavor particles and which prevents the dispersion of the active charcoal particles and/or flavor granular particles.

In order to attain these or other objects, according to the invention, there is provided a method for producing a cigarette filter rod, comprising the following steps of: dispersing active charcoal particles to a paper filter material continuously fed; subsequently folding said filter material with its edge portions being overlapped with each other; gathering, into a thin rod shape, the filter material that laps therein the active charcoal particles with its folded edge portions; and subsequently coating the thin rod-shaped filter material with a coating material to thereby produce a paper filter rod with active charcoal particles.

According to the present invention, there is provided an apparatus for producing a cigarette filter rod, comprising: a paper filter material feeding means for continuously feeding a paper filter material; an active charcoal particles dispersion section for dispersively applying active charcoal particles to the paper filter material; a filter material folding means for folding both edge portions of the paper filter material inwardly so as to lap the active charcoal particles dispersively applied onto the paper filter material; a forming means for gathering, into a thin rod shape, the filter material that laps therein the active charcoal particles; and a winding means for winding the filter material, gathered into the thin rod-shaped paper filter material, with a lapping paper.

According to another aspect of the invention, there is provided a paper cigarette filter rod for being continuously connected to an end of a cigarette, characterized in that creases for absorbing nicotine and tar are formed in an interior of the filter rod, and that active charcoal particles for deodorising odors of tobacco leaves are held in the creases only by a resiliency of a filter material and by the creases.

According to still another aspect of the invention, there is provided a method for producing a cigarette filter rod, comprising the following steps

of: dispersing granular material, which stimulates human taste, to a paper filter material continuously fed; subsequently folding the filter material with its edge portions being overlapped with each other; gathering, into a thin rod shape, the filter material that laps therein the granular material with its folded edge portions; and subsequently coating the thin rod-shaped filter material with a coating material to thereby produce a paper filter rod with granular material.

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings:

Fig. 1 is an illustration of producing process according to the present invention;

Figs. 2 and 3 are perspective views showing the filter material folding section shown in Fig. 1;

Fig. 4 is a cross-sectional view showing the filter folding section and active charcoal particle dispersion section shown in Fig. 1;

Figs. 5, 6 and 7 are illustrations of the operation of the filter folding section shown in Fig. 1;

Fig. 8 is a front view showing a craping rollers shown in Fig. 1; and

Fig. 9 is a cross-sectional view showing an active charcoal particle dispersion section in accordance with another embodiment of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention will now be described with reference to Figs. 1 through 9 which show one example for producing cigarette filter rod with active charcoal particles 3 diffused or dispersed into a filter material 1.

The paper filter material 1 is wound in an original roll 5 from which the paper filter material 1 is continuously drawn. A craping station 6 serves to continuously form longitudinal thin creases in the paper filter material 1. A pair of craping rolls 7 each having a number of circumferential grooves and projections on their outer periphery are rotatably mounted in a suitable position. The longitudinal thin creases 2 are formed in the filter material 1 by means of the craping section 6 so that an air ventilation resistance thereof is increased when the filter material 1 is formed into a rod and therefore, a filtration efficiency of the filter for the nicotine and tar is also increased.

An active charcoal particle dispersing section serves to disperse active charcoal particles. A hopper 10 is provided above the rotary dispersion roller 9. A guide case 11 is provided in front of the rotary dispersion roller 9. The active charcoal particles 3 fed in the hopper 10 is uniformly applied to

the paper filter material continuously fed below the rotary dispersion roller 9.

Fig. 9 shows another embodiment of the active charcoal particle dispersing section 8 in which the guide case 11 is obliquely provided at a predetermined angle.

It is apparent that the active charcoal particle dispersing section 8 is not limited to those shown in the drawings but any structure may be used as the dispersing section as far as it is possible to disperse the active charcoal particles 3 immediately before the commencement of the folding operation of the paper filter material 1.

A filter material folding section 12 serves to fold the paper filter material 1. A retainer plate 13 adjustably suspended from a support rod 25 projecting from a machine body 27 is provided horizontally through a gap corresponding to a thickness of the paper filter material 1 above an upper surface of a receiving plate 26 projecting from the machine body 27. A pair of curved rods 14 which are obliquely close to each other on the front side of the retainer plate 13 are provided on a mount rod 28 projecting from the machine body 27 as best shown in Fig. 3. A curved portion 14' of each curved rod 14 is obliquely provided so as to depress downwardly both edge portions of the paper filter material 1 which has been subjected to the creases or steps by the roller 17.

A pair of clamping thin plates 22 are provided on both sides on the upper surface of the retainer plate 13 for clamping, inwardly gathering and folding the edge portions 1' depressed downwardly and pressed inwardly by the curved portions 14' of the curved rods 14.

The pair of clamping thin plate 22 cause both the edge portions 1' of the paper filter material 1 raised inwardly by the curved portions 14' of the curved rods 14 to be well drawn inwardly to thereby continuously form overlapping portions along the edge portions of the filter material 1. At the same time, the clamping thin plates 22 are arranged so as to intersect with each other from the front side (upstream side) to the rear side (downstream side) of the retainer plate 13 (as best shown in Fig. 2) and so as to increase a distance between the clamping plates 22 and the retainer plate 13 toward the rear side (downstream side) for retaining the overlapping portion 24 in cooperation with the retainer plate 13.

Reference numeral 31 denotes a mount support portion and numeral 32 denotes an introduction window for the active charcoal particles 3.

Reference numeral 15 denotes a forming section for forming into a thin rod-shaped bundle the paper filter material 1 which has been dispersively coated with the active charcoal particles 3 and which lapps the active charcoal particles 3 by the

curved rods 14 and the clamping thin plates 22. The filter material 1 is passed through a sleeve portion 16 which is gradually tapered forwardly, so that the filter material 1 is continuously throttled to form a thin rod-shaped bundle.

Reference numeral 18 denotes a lapping section for continuously coating the thin rod-shaped filter material 1 with a lapping paper 19. Reference numeral 20 denotes a wind roll of the lapping paper 19, numeral 21 denotes a pressure indicator of filter feeding air, numeral 29 denotes a cutter section and numeral 30 denotes a filter rod.

The operation of the thus constructed apparatus will be described.

Longitudinal thin creases 2 are formed in the paper filter material 1 continuously drawn from the original roll 5 through the craping section 6 and are fed into the filter folding section 12. The longitudinal thin creases 2 serve as final creases formed in the interior of the filter rod.

The opposite edge portions of the filter material 1 are inwardly raised by the curved portions 14' of the curved rods 14. Subsequently, the active charcoal particles 3 are dispersed through the guide case 11 from the rotary dispersion roller 9 located in the upper portion. Since the rear surfaces of the opposite edge portions 1' raised by the curved portions 14' are in contact with the inner edges of the clamping thin plates 22, the clamping thin plates 22 are arranged so as to intersect with each other, and the distance between the clamping plates 22 and the retainer plate 13 is increased toward the rear side (i.e., the downstream side), the opposite edge portions 1' are drawn inwardly to each other by the feed of the filter material 1. At the same time, the edge portions 1' are overlapped to form the overlapping portion 24 which is fed in this state. Accordingly, the opposite edge portions 1' of the paper filter material 1 lap the active charcoal particles 3 (see Fig. 2) and are led to the sleeve portion 16 of the forming section 15. Thus, it is possible to overcome the problem that the active charcoal particles are dispersed outwardly when the feed rate of the filter material 1 is increased.

After the filter material 1 has been introduced into the sleeve portion 16, in the lapping section 18, the lapping paper 19 laps the thin rod-shaped bundle of paper filter material 1 to form a continuous filter material containing the active charcoal. Thereafter, the filter is cut into a predetermined length in the cutter section 29 to complete the formation of the filter rod 30 containing the active charcoal.

It should be noted that the paper filter rod 30 is a filter in which the active charcoal particles 3 are held only by the resiliency of the paper due to the provision of the internal creases (longitudinal creases or crapes 2) and the throttle effect im-

parted in the forming section 15, and it is unnecessary to use the binders or the like.

The filter rod 30 is further cut and attached to the end of the cigarette for use as the cigarette filter.

If, instead of the active charcoal particles 3 or together with the active charcoal particles 3, flavor particles such as lemon flavor and peppermint flavor or powders such as dry fine granular powders of fruit juice which stimulate the human taste such palate or odor taste are used, the particles are not dispersed outside, and the flavor effect is not reduced in the filter rod with powders.

According to the present invention as described above, the step of applying binders to the paper filter material may be dispensed with. Accordingly, it is unnecessary to effect the binder drying step. Also, since the granular material such as active charcoal particles and flavor particles are delivered under the condition that the particles are lapped by the folded paper filter material even if the paper filter material is delivered at a high feed rate, there is no fear that the charcoal particles, flavor particles or the like would be dispersed to the outside. It is therefore possible to produce filter rods at a high speed production rate. Since no binders are attached to the surfaces of the active charcoal particles, the deodorant effect would not degraded and the flavor effect of the flavor material or the like would not deteriorate.

In addition, since the thus produced cigarette filter rods have a desired exact content of the active charcoal particles and no binders are used therein, it is possible to provide cigarette filter rods which are capable of effectively deodorising the odor of the tobacco leaves. As described above, according to the invention, it is possible to enjoy the various advantages.

Claims

1. A method for producing a cigarette filter rod (30), comprising the steps of:
 - (a) dispersing dispersible particles (3) to a paper filter material (1) continuously fed;
 - (b) forming said paper filter material (1) coated with said dispersible particles (3) into a thin rod-shaped bundle; and
 - (c) subsequently coating the thin rod-shaped filter material with a coating material (19) to thereby produce said cigarette filter rod (30) with said dispersible particles; characterized by further comprising the step of
 - (d) folding said paper filter material (1) with its edge portions (1') being overlapped with each other in order to cover said dispersible particles (3) dispersed to said paper filter

- material (1) prior to said step of forming said paper filter material (1) coated with said dispersible particles (3) into a thin rod-shaped bundle.
2. The method according to claim 1, wherein said dispersible particles (3) include active charcoal particles. 5
 3. The method according to claim 1 or 2, wherein said dispersible particles (3) include stimulant flavor granular particles. 10
 4. The method according to claim 1 or 2, wherein no binder applying step is effected between said dispersing step (a) and said folding step (d). 15
 5. The method according to claim 1 or 2, wherein no binder applying step is effected between said dispersing step (a) and said forming step (b). 20
 6. The method according to claim 1 or 2, wherein no binder applying step is effected during a period of all the steps. 25
 7. An apparatus for producing a cigarette filter rod (30), comprising:
 - a paper filter material feeding means for continuously feeding a paper filter material (1), 30
 - a dispersible particle dispersion means (8) for dispersively applying dispersible particles (3) to said paper filter material (1);
 - a forming means (15) for forming, into a thin rod shape, said paper filter material (1) coated with said dispersible particles (3); and 35
 - a lapping means (18) for lapping the thin rod-shaped filter material with a lapping paper (19); characterized by 40
 - a filter material folding means (12) for folding both edge portions (1') of said paper filter material (1) inwardly so as to lap the dispersible particles (3) dispersively applied onto said paper filter material (1). 45
 8. The apparatus according to claim 7, characterized in that said dispersible particle dispersion means (8) is adapted to disperse active charcoal particles. 50
 9. The apparatus according to claim 7 or 8, characterized in that said dispersible particle dispersion means (8) is adapted to disperse stimulant flavor granular particles. 55
 10. The apparatus according to claim 7 or 8, wherein no binder applying means is provided between said dispersing means (8) and said folding means (12).
 11. The apparatus according to claim 7 or 8, wherein no binding applying means is provided between said dispersion means (8) and said forming means (15).
 12. The apparatus according to claim 7 or 8, wherein no binder applying means is provided in the overall means of said apparatus.
 13. The apparatus according to claim 7, wherein said dispersion means (8) includes a hopper (10) for the dispersible particles (3) and a guide case (11) for guiding said dispersible particles (3) to said filter material (1).
 14. The apparatus according to claim 13, wherein said guide case (11) is obliquely provided for uniformly applying said dispersible particles (3) onto said filter material (1).
 15. The apparatus according to claim 7, further comprising a craping means (6, 7) for applying creases (2) to said filter material (1), said craping means (6, 7) being located upstream of said folding means (12).
 16. The apparatus according to claim 7, wherein said folding means (12) includes a pair of curved rod members (14), a pair of clamping thin plates (22) serving in cooperation with said rod members (14), and a retainer plate (13).
 17. The apparatus according to claim 16, wherein a distance between said clamping plates (22) and said retainer plate (13) is increased toward the downstream side of said filter material (1).
 18. The apparatus according to claim 7, wherein said particle dispersion means (8) is located substantially above said filter material folding means (12).
 19. A paper cigarette filter rod (30) for being continuously connected to an end of a cigarette, said cigarette filter rod (30) being made of a paper filter material (1) onto which dispersible particles (3) are dispersed prior to said paper filter material (1) being formed into a rod shape, characterized in that
 - said paper filter material (1) has creases (2) formed therein prior to the dispersion of said dispersive particles (3) and
 - said dispersive particles (3) are held only by the resiliency of said paper filter material (1)

due to the provision of said creases (2) and by said paper filter material (1) being formed into a rod shape.

20. The filter rod according to claim 19, wherein said dispersible particles (3) include active charcoal particles. 5
21. The filter rod according to claim 19 or 20, wherein said dispersible particles (3) include stimulant flavor particles. 10

Patentansprüche

1. Verfahren zur Herstellung eines Zigarettenfilterstäbchens (30), umfassend die Schritte: 15
 - (a) Verstreuen von streufähigen Teilchen (3) auf ein kontinuierlich zugeführtes Papierfiltermaterial (1);
 - (b) Formen des mit den besagten streufähigen Teilchen (3) beschichteten Papierfiltermaterials (1) zu einem dünnen stäbchenförmigen Bündel; und 20
 - (c) anschließendes Umhüllen des dünnen stäbchenförmigen Filtermaterials mit einem Überzugsmaterial (19), um dadurch das besagte Zigarettenfilterstäbchen (30) mit den besagten streufähigen Teilchen herzustellen; 25

dadurch gekennzeichnet, daß es weiter den Schritt umfaßt:
 - (d) Falten des besagten Papierfiltermaterials (1), wobei seine Randteile (1') miteinander zur Überlappung gebracht werden, um vor dem besagten Schritt einer Formgebung des mit den streufähigen Teilchen (3) beschichteten Papierfiltermaterials (1) zu einem dünnen stäbchenförmigen Bündel die streufähigen, auf das besagte Papierfiltermaterial (1) verstreuten Teilchen (3) abzudecken. 30
2. Verfahren nach Anspruch 1, dadurch gekennzeichnet, daß die besagten streufähigen Teilchen (3) Aktivkohleteilchen einschließen. 35
3. Verfahren nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß die besagten streufähigen Teilchen (3) anregende körnige Aromateilchen einschließen. 40
4. Verfahren nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß zwischen dem besagten Schritt des Verstreuens (a) und dem besagten Schritt des Faltens (d) kein Schritt eines Auftrags von Bindemittel ausgeführt wird. 45
5. Verfahren nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß zwischen dem besagten Schritt des Verstreuens (a) und dem besagten Formgebungsschritt (b) kein Schritt eines Auftrags von Bindemittel ausgeführt wird. 50
6. Verfahren nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß während eines Zeitraums sämtlicher Schritte kein Schritt eines Auftrags von Bindemittel ausgeführt wird. 55
7. Vorrichtung zur Herstellung eines Zigarettenfilterstäbchens (30) umfassend:
 - eine Papierfiltermaterial-Zufuhreinrichtung, um ein Papierfiltermaterial (1) kontinuierlich zuzuführen,
 - eine Verstreueinrichtung (8) für streufähige Teilchen, um streufähige Teilchen (3) durch Verstreuen auf das besagte Papierfiltermaterial (1) aufzubringen;
 - eine Formgebungseinrichtung (15), um das mit den besagten streufähigen Teilchen (3) beschichtete Papierfiltermaterial (1) zu einer dünnen Stäbchenform zu formen; und
 - eine Einhüleinrichtung (18), um das dünne stäbchenförmige Filtermaterial mit einem Hüllpapier (19) zu umhüllen;

gekennzeichnet durch

 - eine Filtermaterial-Falteinrichtung (12), um beide Randteile (1') des besagten Papierfiltermaterials (1) nach innen zu falten, so daß sie die durch Verstreuen auf das besagte Papierfiltermaterial (1) aufgetragenen streufähigen Teilchen (3) einhüllen.
8. Vorrichtung nach Anspruch 7, dadurch gekennzeichnet, daß die besagte Verstreueinrichtung (8) für streufähige Teilchen zum Verstreuen von Aktivkohleteilchen angepaßt ist.
9. Vorrichtung nach Anspruch 7 oder 8, dadurch gekennzeichnet, daß die besagte Verstreueinrichtung (8) für streufähige Teilchen zum Verstreuen von anregenden körnigen Aromateilchen angepaßt ist.
10. Vorrichtung nach Anspruch 7 oder 8, dadurch gekennzeichnet, daß zwischen der besagten Verstreueinrichtung (8) und der besagten Falteinrichtung (12) keine Bindemittelauftragseinrichtung vorgesehen ist.
11. Vorrichtung nach Anspruch 7 oder 8, dadurch gekennzeichnet, daß zwischen der besagten Verstreueinrichtung (8) und der besagten Formgebungseinrichtung (15) keine Bindemittelauftragseinrichtung vorgesehen ist.

12. Vorrichtung nach Anspruch 7 oder 8, dadurch gekennzeichnet, daß in der gesamten Einrichtung der besagten Vorrichtung keine Bindemittelauflageeinrichtung vorgesehen ist.

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13. Vorrichtung nach Anspruch 7, dadurch gekennzeichnet, daß die besagte Verstreueinrichtung (8) einen Vorratsbehälter (10) für die streufähigen Teilchen (3) und ein Führungsgehäuse (11) zum Führen der besagten streufähigen Teilchen (3) zum besagten Filtermaterial (1) einschließt.

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14. Vorrichtung nach Anspruch 13, dadurch gekennzeichnet, daß das besagte Führungsgehäuse (11) in einer geneigten Richtung vorgesehen ist, um die besagten streufähigen Teilchen (3) gleichmäßig auf das besagte Filtermaterial (1) aufzubringen.

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15. Vorrichtung nach Anspruch 7, dadurch gekennzeichnet, daß sie weiter eine Kreppeinrichtung (6,7) umfaßt, um Falten (2) in das besagte Filtermaterial (1) einzubringen, wobei die besagte Kreppeinrichtung (6,7) eintrittseitig von der besagten Falteinrichtung (12) angeordnet ist.

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16. Vorrichtung nach Anspruch 7, dadurch gekennzeichnet, daß die besagte Falteinrichtung (12) ein Paar gebogene Stabelemente (14), ein Paar dünne Klemmplatten (22), die ihren Dienst in Zusammenarbeit mit den besagten Stabelementen (14) verrichten, sowie eine Halteplatte (13) einschließt.

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17. Vorrichtung nach Anspruch 16, dadurch gekennzeichnet, daß ein Abstand zwischen den besagten Klemmplatten (22) und der besagten Halteplatte (13) in Richtung der Austrittseite des besagten Filtermaterials (1) größer wird.

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18. Vorrichtung nach Anspruch 7, dadurch gekennzeichnet, daß die besagte Teilchen-Verstreueinrichtung (8) im wesentlichen über der besagten Filtermaterial-Falteinrichtung (12) angeordnet ist.

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19. Papier-Zigarettenfilterstäbchen (30), das zusammenhängend mit einem Ende einer Zigarette verbunden werden soll, wobei das besagte Zigarettenfilterstäbchen (30) aus einem Papierfiltermaterial (1) hergestellt ist, auf welches streufähige Teilchen (3) gestreut werden, bevor das besagte Papierfiltermaterial (1) zu einer Stäbchenform geformt wird, dadurch gekennzeichnet, daß das besagte Papierfiltermaterial (1) Falten

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(2) aufweist, die vor dem Verstreuen der besagten streufähigen Teilchen (3) darin gebildet werden, und

die besagten streufähigen Teilchen (3) nur durch die Elastizität des besagten Papierfiltermaterials (1) aufgrund der Bereitstellung der besagten Falten (2) sowie durch die Formgebung des besagten Papierfiltermaterials (1) zu einer Stäbchenform gehalten werden.

20. Filterstäbchen nach Anspruch 19, dadurch gekennzeichnet, daß die besagten streufähigen Teilchen (3) Aktivkohleteilchen einschließen.

21. Filterstäbchen nach Anspruch 19 oder 20, dadurch gekennzeichnet, daß die besagten streufähigen Teilchen (3) anregende Aromateilchen einschließen.

Revendications

1. Procédé de production d'une tige (30) de filtre à cigarettes, qui comprend les étapes à :

a) disperser des particules dispersibles (3) dans un matériau (1) de filtre en papier (1) avançant en continu,

b) transformer ledit matériau (1) de filtre en papier recouvert desdites particules dispersibles (3) en un faisceau en forme de mince tige et

c) recouvrir ensuite le matériau de filtre en forme de mince tige d'un matériau de revêtement (19) pour produire ainsi ladite tige (30) de filtre à cigarettes avec lesdites particules dispersibles,

caractérisé par le fait qu'il comprend en outre l'étape consistant à :

d) replier ledit matériau (1) de filtre en papier en faisant se chevaucher ses parties marginales (1') afin de recouvrir lesdites particules dispersibles (3) dispersées dans ledit matériau (1) de filtre en papier avant ladite étape de transformation dudit matériau (1) de filtre en papier recouvert desdites particules dispersibles (3) en un faisceau en forme de mince tige.

2. Procédé selon la revendication 1, dans lequel lesdites particules dispersibles (3) contiennent des particules de charbon actif.

3. Procédé selon la revendication 1 ou 2, dans lequel lesdites particules dispersibles (3) contiennent des particules granulaires aromatisantes et stimulantes.

4. Procédé selon la revendication 1 ou 2, dans lequel aucune étape d'application de liant n'est

- effectuée entre ladite étape de dispersion (a) et ladite étape de pliage (d).
5. Procédé selon la revendication 1 ou 2, dans lequel aucune étape d'application de liant n'est effectuée entre ladite étape de dispersion (a) et ladite étape de transformation (b). 5
 6. Procédé selon la revendication 1 ou 2, dans lequel aucune étape d'application de liant n'est effectuée pendant la durée de toutes les étapes. 10
 7. Appareil de production d'une tige (30) de filtre à cigarettes, qui comprend : 15
 - un moyen d'amenée d'un matériau de filtre en papier, destiné à amener en continu un matériau (1) de filtre en papier,
 - un moyen (8) de dispersion de particules dispersibles, destiné à appliquer de manière dispersée des particules dispersibles (3) sur ledit matériau (1) de filtre en papier, 20
 - un moyen de transformation (15) destiné à transformer en une tige mince ledit matériau (1) de filtre en papier recouvert desdites particules dispersibles (3), et 25
 - un moyen de recouvrement (18) destiné à recouvrir le matériau de filtre en forme de tige mince par un papier de recouvrement (19), 30
 - caractérisé par un moyen (12) de pliage du matériau de filtre, destiné à replier les deux parties marginales (1') dudit matériau (1) de filtre en papier vers l'intérieur pour recouvrir les particules dispersibles (3) appliquées de manière dispersée sur ledit matériau (1) de filtre en papier. 35 40
 8. Appareil selon la revendication 7, caractérisé en ce que ledit moyen (8) de dispersion de particules dispersibles est capable de disperser des particules de charbon actif. 45
 9. Appareil selon la revendication 7 ou 8, caractérisé en ce que ledit moyen (8) de dispersion de particules dispersibles est capable de disperser des particules granulaires aromatisantes et stimulantes. 50
 10. Appareil selon la revendication 7 ou 8, dans lequel aucun moyen d'application de liant n'est prévu entre ledit moyen de dispersion (8) et ledit moyen de pliage (12). 55
 11. Appareil selon la revendication 7 ou 8, dans lequel aucun moyen d'application de liant n'est prévu entre ledit moyen de dispersion (8) et ledit moyen de transformation (15).
 12. Appareil selon la revendication 7 ou 8, dans lequel aucun moyen d'application de liant n'est prévu dans les moyens généraux dudit appareil.
 13. Appareil selon la revendication 7, dans lequel ledit moyen de dispersion (8) comprend une trémie (10) destinée aux particules dispersibles (3) et un capot de guidage (11) pour guider lesdites particules dispersibles (3) vers ledit matériau de filtre (1).
 14. Appareil selon la revendication 13, dans lequel ledit capot de guidage (11) est placé obliquement pour appliquer uniformément lesdites particules dispersibles (3) sur ledit matériau de filtre (1).
 15. Appareil selon la revendication 7, comprenant en outre un moyen de plissage (6, 7) pour réaliser des plis (2) dans ledit matériau de filtre (1), ledit moyen de plissage (6, 7) étant situé en amont du moyen de pliage (12).
 16. Appareil selon la revendication 7, dans lequel ledit moyen de pliage (12) comprend une paire de barres coudées (14), une paire de minces plaques de serrage (22) qui coopèrent avec lesdites barres coudées (14) et une plaque de retenue (13).
 17. Appareil selon la revendication 16, dans lequel la distance entre lesdites plaques de serrage (22) et ladite plaque de retenue (13) augmente en direction du côté aval dudit matériau de filtre (1).
 18. Appareil selon la revendication 7, dans lequel ledit moyen (8) de dispersion de particules est placé sensiblement au-dessus dudit moyen de pliage (12) du matériau de filtre.
 19. Tige (30) de filtre à cigarettes en papier devant être raccordée en continu à une extrémité d'une cigarette, ladite tige (30) de filtre à cigarettes étant faite de matériau (1) de filtre en papier sur lequel sont dispersées des particules dispersibles (3) avant que ledit matériau (1) de filtre en papier ne soit transformé en forme de tige, caractérisée en ce que :
 - ledit matériau (1) de filtre en papier comporte des plis (2) qui y sont formés avant la dispersion desdites particules dispersibles (3),

et

lesdites particules dispersibles (3) ne sont retenues que par l'élasticité dudit matériau (1) de filtre en papier due à la présence des plis (2) et par le fait que ledit matériau (1) de filtre en papier est transformé en une tige. 5

20. Tige de filtre selon la revendication 19, dans laquelle lesdites particules dispersibles (3) contiennent des particules de charbon actif. 10

21. Tige de filtre selon la revendication 19 ou 20, dans laquelle lesdites particules dispersibles (3) contiennent des particules aromatisantes et stimulantes. 15

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FIG. 1

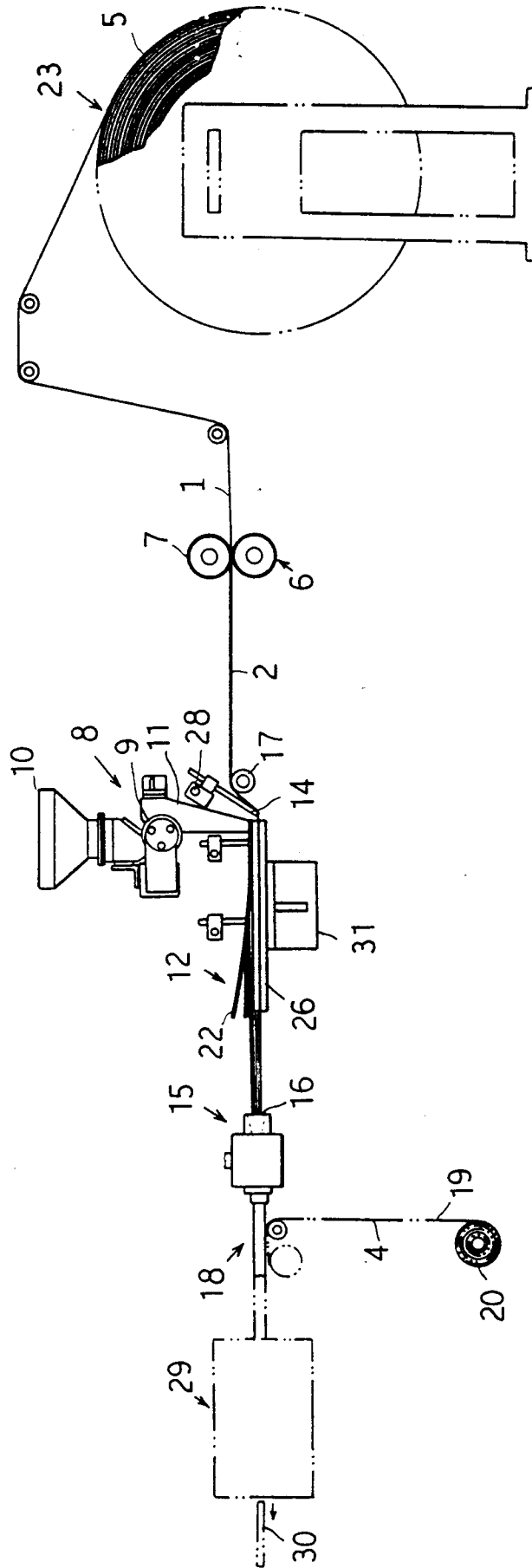


FIG. 2

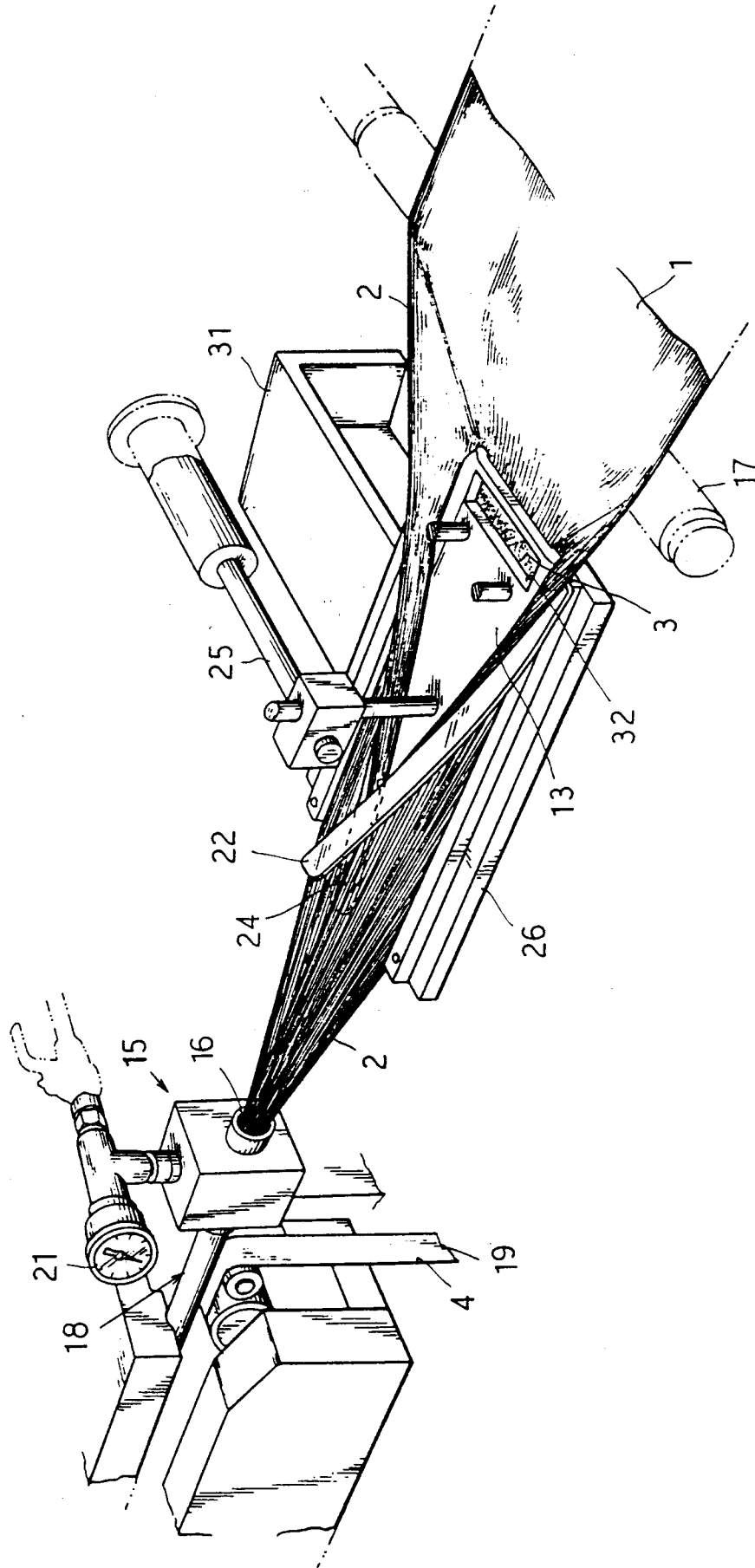


FIG. 3

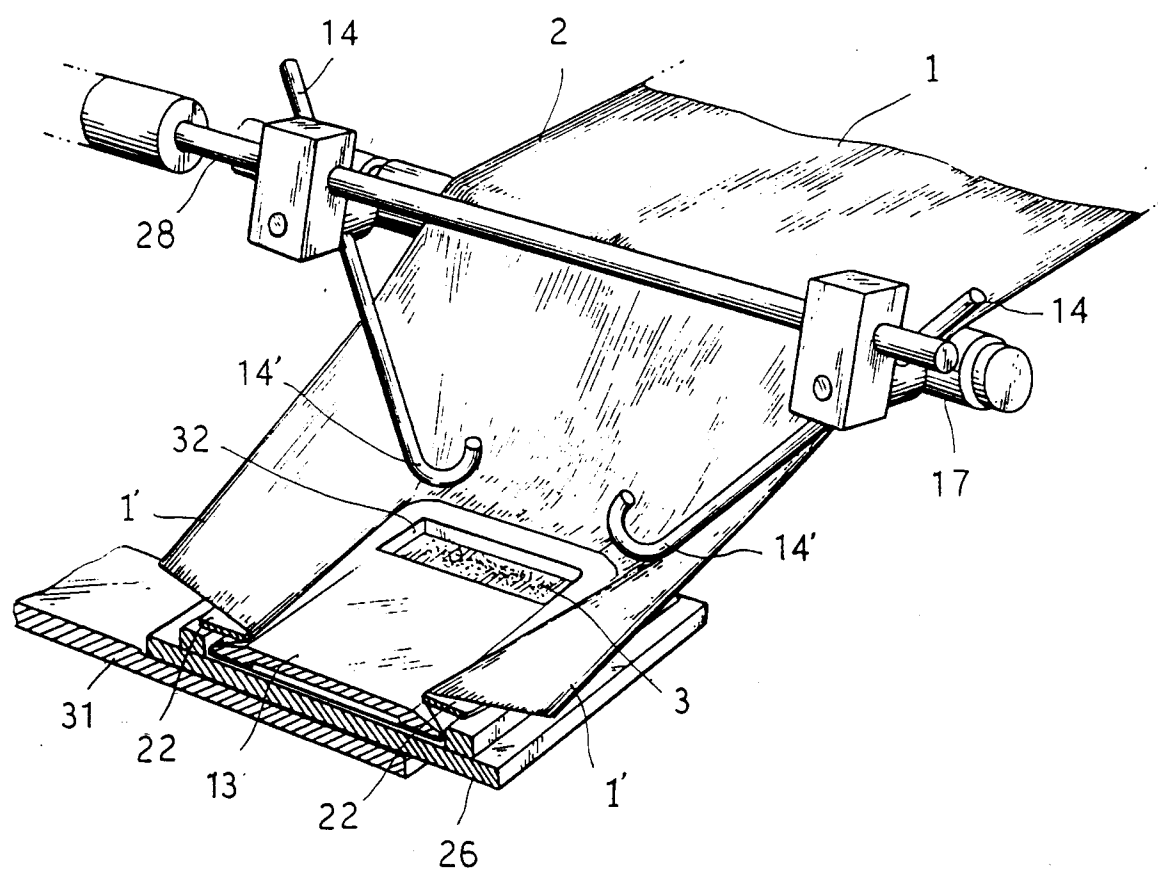


FIG. 4.

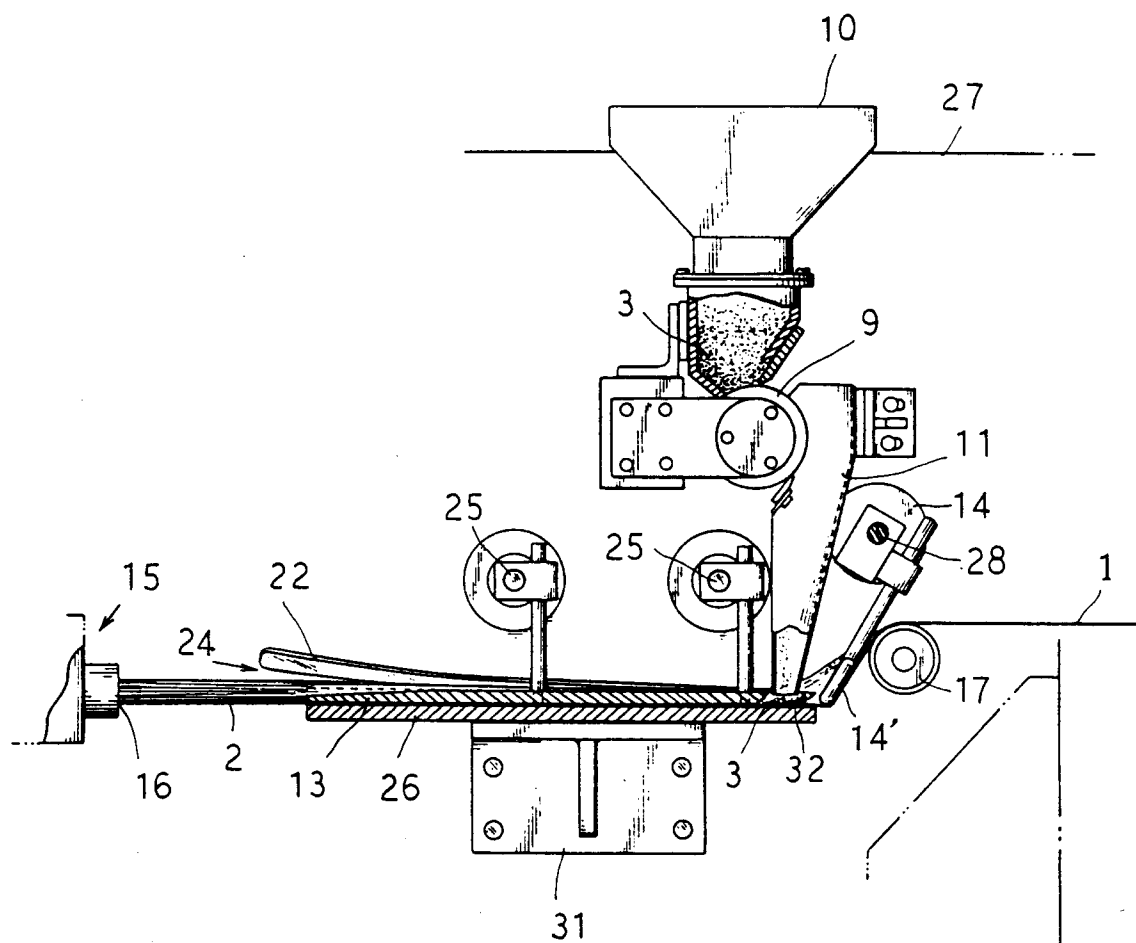


FIG. 5

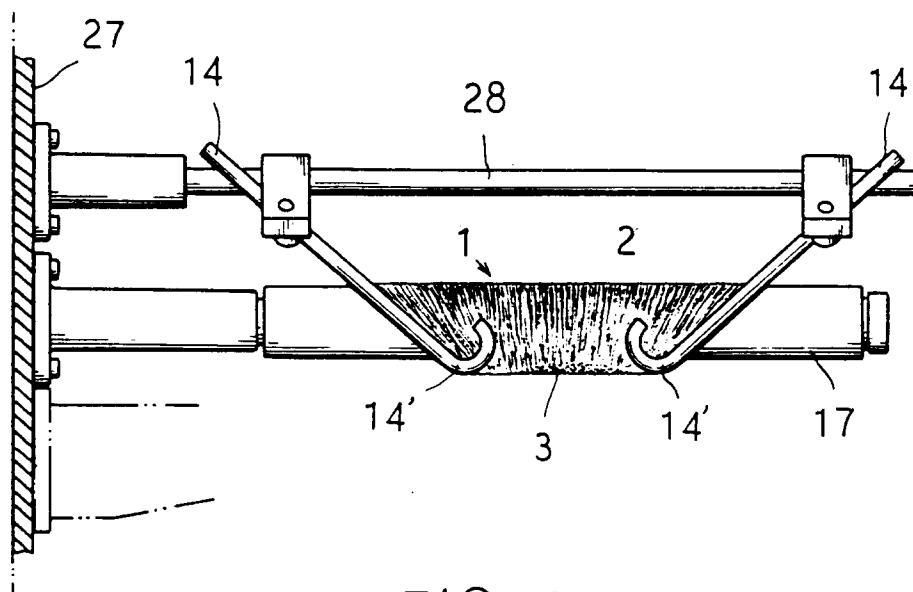


FIG. 6

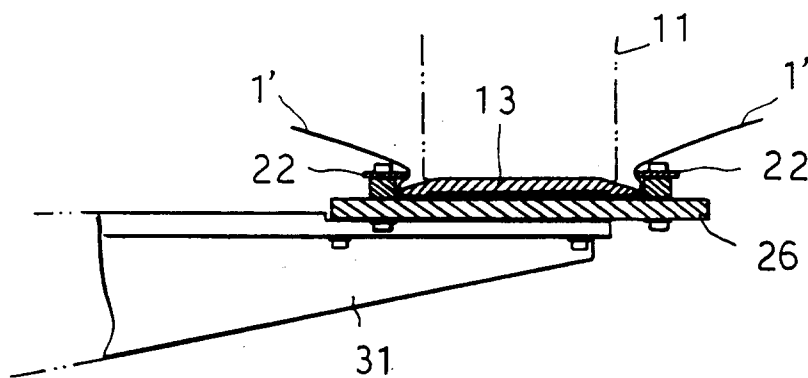


FIG. 7

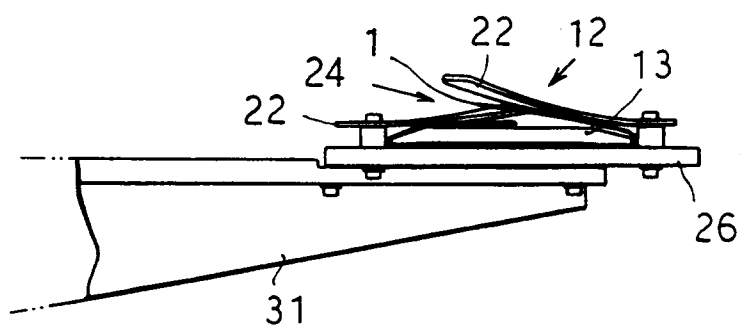


FIG. 8

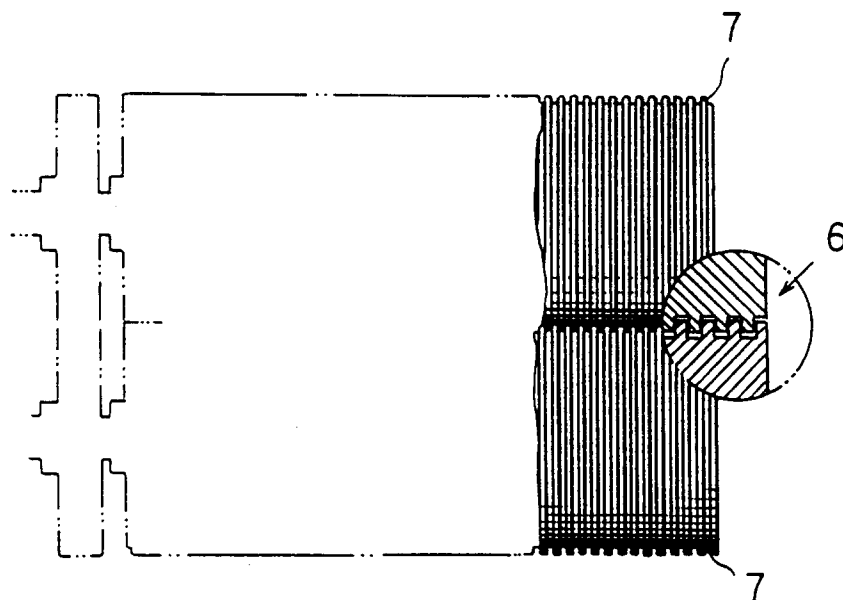


FIG. 9

