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(72) Inventors:

- **QIAN, Jian Bing  
Guangdong 516157 (CN)**
- **ZHAN, Bao Ming  
Guangdong 516157 (CN)**
- **HUA, Qin  
Guangdong 516157 (CN)**

(71) Applicant: **Soul-Tour Electronics (Huizhou) Co., Ltd.**

**Huizhou, Guangdong 516100 (CN)**

(74) Representative: **Klunker IP**

**Patentanwälte PartG mbB  
Destouchesstraße 68  
80796 München (DE)**

(54) **CASING FOR HEAT-NOT-BURN CIGARETTE**

(57) The present invention provides a shell for heat-not-burn ceramic film tobacco, comprising a main tobacco tube, a sealing paper located at one end of the tobacco tube and a filter tip located at the other end of the tobacco tube, wherein a ceramic film is arranged on a contact layer in contact with tobacco in the tobacco tube. A ceramic film is arranged on a contact surface of the sealing paper and the tobacco. According to the shell

for heat-not-burn tobacco provided in the present invention, the ceramic film of the shell is directly applied to a packaging layer which comes in direct contact with the tobacco, such that the component stability of a heat-not-burn tobacco can be greatly increased, and the moisture retention property of tobacco substances is significantly improved.

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## Description

### TECHNICAL FIELD

[0001] The present invention relates to the field of heat-not-burn tobacco, and in particular to a shell for heat-not-burn tobacco.

### BACKGROUND

[0002] In recent years, heat-not-burn tobacco has appeared in the tobacco industry, the scale of production, the level of technical innovation and its market share being constantly expanded, improved and increased. The heat-not-burn tobacco has the characteristics of both an electronic cigarette and a cigarette. The tobacco substances are heated by an electric heating appliance, but the heating temperature is far lower than the burning point of the tobacco, so that the smoke with the characteristic fragrance of the tobacco and lower toxicity is obtained.

[0003] At present, most of the heat-not-burn tobacco in the market is divided into two types, wherein one type is a cigarette structure, the cigarette paper and the tipping paper are used for packaging tobacco, the packaging structure is fragile and easy to break, the tail end is in an open state and is easy to cause moisture imbalance, and thus the shelf life is short; the other type is that a paper tube is used as a packaging shell, the outer surface of the paper tube is wrapped with tipping paper, the structure is firm, and a sealing end surface is arranged at the tail end of the paper tube, so that the contact between tobacco and air is less, the moisture loss is slow, and thus the shelf life is longer.

[0004] In the above two existing heat-not-burn tobacco structures, because the tobacco substance directly contacts with the paper material, and the paper material itself has the characteristics of ventilation and flammability, the moisture in the tobacco is easy to run off through the permeation and the outward volatilization of the paper material, and even the use effect of the tobacco can be influenced. In addition, when the tobacco is heated, the innermost paper material directly contacting the tobacco is easy to generate smoldering phenomenon to cause coking, with emitting the burning smell.

[0005] In the field of traditional cigarettes, as for packaging paper, coating the surface of a packaging paper with a ceramic film is widely adopted in the market with mature technologies, wherein the packaging paper coated with a ceramic film is used as the inner lining paper of a shell for tobacco; in addition, in the prior patent technology, ceramic particles and a binder are mixed, and the mixture is used as a coating to be applied to the surface of the cigarette paper or the ceramic cigarette paper is manufactured by a paper making process, so that the aim of optimizing the smoke quality by using the ceramic particles is fulfilled. However, as this technology is aimed at traditional burning cigarettes, in order to realize combustibility and incinerating, it is necessary to add com-

bustion improver to make up for the "shortcomings" of flame retardance by ceramics, which leads to high cost and complicated process. Therefore, this kind of technology has its own technical defects, so it limits its wide use in the market.

[0006] For the above problems, in order to slow down the loss of moisture in the tobacco and keep the stability of the internal components of the tobacco, the inventors of the present invention have found through a great deal of research that: the aims of stabilizing components and keeping moisturizing for a long time can be effectively fulfilled by utilizing the ceramic film in the film coating technology. For the film coating technology, a clay film, a porcelain film, a silicon film, or the like can be adopted, wherein the inventors have further found through extensive experiments that the raw material treatment used in the clay film coating technology is the simplest, the production process is the simplest, and the clay film coating technology is most adaptable to various environments.

### SUMMARY

[0007] In order to solve the above problems in the prior art, the present invention aims to provide a shell for heat-not-burn tobacco, which directly applies a ceramic film to a tobacco packaging layer in direct contact with the ceramic film so as to overcome the above defects in the packaging technology of heat-not-burn tobacco in the prior art, thereby realizing the remarkable beneficial effects of greatly improving the component stability and significantly improving the wetness and moisture retention properties of tobacco substances by heat-not-burn tobacco.

[0008] According to an aspect of the present invention, a ceramic film shell for heat-not-burn tobacco is provided, comprising a main tobacco tube, a sealing paper located at one end of the tobacco tube and a filter tip located at the other end of the tobacco tube, wherein a ceramic film is arranged on a contact layer in contact with tobacco in the tobacco tube.

[0009] Preferably, a ceramic film is arranged on a contact surface of the sealing paper and the tobacco.

[0010] Preferably, the ceramic film sealing paper is a double-surfaced film-coated paper, namely, a ceramic film is arranged on one surface of the ceramic film sealing paper, and an impermeable film is arranged on the other surface of the ceramic film sealing paper. More preferably, the impermeable film is preferably an aluminum film.

[0011] Preferably, a gram weight of the ceramic film of the tobacco tube and the ceramic film of the sealing paper is 2-10 gsm.

[0012] Preferably, a tipping paper is arranged on an outer surface of the tobacco tube provided with the ceramic film.

[0013] Preferably, the gram weight of the ceramic film of the sealing paper is greater than the gram weight of the ceramic film of the tobacco tube.

[0014] Preferably, the tobacco tube is a paper tube

manufactured by spirally rolling a plurality of layers of paper or a paper tube manufactured by directly rolling flat-plate cigarette paper.

**[0015]** Preferably, one surface of paper for manufacturing the tobacco tube is a smooth surface, the other surface of the paper for manufacturing the tobacco tube is a rough surface with certain roughness, and the ceramic film is arranged on the rough surface of the paper with the roughness; one surface of the ceramic film sealing paper is a smooth surface, the other surface of the ceramic film sealing paper has certain roughness to form a rough surface, and the ceramic film is arranged on the rough surface of the paper with the roughness. If an impermeable film is further arranged on the ceramic film sealing paper, the impermeable film can be arranged on the smooth surface.

**[0016]** Preferably, a plurality of through holes are formed in the sealing paper, and a porosity is not less than 4%, so that good air permeability can be ensured, and the sealing paper can be smoothly sucked without obvious obstruction. The inventors have found that the porosity is more preferably 12.6%, and this porosity is particularly preferable in terms of improvement of air permeability and suction smoothness. It should be noted herein that the porosity is a ratio of a total area of the through holes to an area of an inner diameter circle of an end surface of the tobacco tube. In addition, the hole diameter of each through hole is preferably 0.2 mm, and a center distance of the holes is preferably 0.5 mm.

**[0017]** Preferably, the ceramic film is a clay film, a porcelain film, a silicon film or a similar material film, and a color of the ceramic film is preferably milky white. More preferably, the ceramic film is a clay film.

**[0018]** Preferably, the ceramic film paper tube is manufactured by rolling 65-gsm paper for manufacturing a ceramic film paper tube, 120-gsm paper for manufacturing a paper tube and 60-gsm paper for manufacturing a paper tube in a combined manner, the ceramic film sealing paper is manufactured by 77-gsm film-coated paper formed by coating a rough surface of 70-gsm base paper with a ceramic film and coating a smooth surface of the base paper with an aluminum film, and holes are uniformly punched in the film-coated paper, with a hole diameter being 0.20 mm, a center distance of the holes being 0.50 mm, and a porosity being 12.6%.

**[0019]** By adopting the above structure, the present invention has the following characteristics:

1. The ceramic film shell for heat-not-burn tobacco of the present invention can realize the wetness and moisture retention effects of tobacco for a long time and balance effective substances. During the film coating and forming processes, the surface of the ceramic film forms a porous structure, which is beneficial to adjusting the stability of components in the shell for tobacco and slowing down volatilization or deterioration.

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2. The ceramic film shell for heat-not-burn tobacco of the present invention has the flame-retardant and heat-insulating properties, and the high-temperature resistance of the ceramic film can effectively isolate heat, so that the heat of a heating medium in a tobacco tube can be concentrated, and the heating is more effectively realized. In addition, the outer layer paper of the tobacco tube is not affected by high temperature and thus cannot be coked, thereby preventing the human body from being scalded, and the ceramic film shell for heat-not-burn tobacco is safer.

3. The ceramic film shell for heat-not-burn tobacco of the present invention can prevent the tobacco tube from generating peculiar smell in a high-temperature environment. In the field of heat-not-burn tobacco, the heating temperature is generally 280 °C to 480 °C, and the inner wall of a paper tobacco tube without a ceramic film is easy to smolder in the high-temperature environment, so that the smell of paper burning is generated, and the taste is influenced by this smell together with the smell of smoke, bringing unhappiness. Compared with the prior art, the ceramic film tobacco tube adopting the ceramic film can significantly improve the high temperature resistance, thereby effectively avoiding the occurrence of the above conditions, namely effectively avoiding the generation of peculiar smell and ensuring the purity of smoke.

4. According to the ceramic film shell for heat-not-burn tobacco of the present invention, since the ceramic film is arranged on the paper for manufacturing the ceramic film tobacco tube, so that the mechanical strength of the paper can be significantly improved, and thus the mechanical strength and firmness of the shell for tobacco are significantly enhanced. The density of the ceramic film is far higher than that of paper, the strength of the paper provided with the ceramic film is significantly higher than that of base paper, so that the paper with ceramic film is flexible, not easy to damage, not easy to soften and wrinkle, convenient to cut or wrap, favorable for storage, transportation and equipment use, and more convenient to use in production and operation; moreover, the hardness of the shell for tobacco can be greatly improved, so that the structure of tobacco is more stable and is not easy to bend and deform.

5. In the present invention, a clay film is especially preferred, wherein the film coating process is that the resin is mixed with various clay powder, the surface of paper is coated with the mixture evenly, followed by water evaporation after drying, and the dried clay film is formed on the surface of paper. The clay film formed from this process has a porous film structure, and thus has a very fine moisture retention characteristic; in addition, because the clay contains

a large amount of silicon crystals, the clay film has the characteristics of excellent high temperature resistance, heat insulation and flame retardance.

6. The ceramic film shell for heat-not-burn tobacco of the present invention is suitable for various heat-not-burn tobacco products, and is suitable for tobacco particles, tobacco sheets, tobacco leaf groups or other tobaccos and derivative products thereof.

7. The material for manufacturing the ceramic film is natural, green and environment-friendly, and renewable.

8. The cost is saved, the use amount of paper in the shell for tobacco can be greatly reduced by adopting a ceramic film coating technology, and the ceramic film shell for heat-not-burn tobacco of the present invention is more economical and practical, in accordance with sustainable development.

## DETAILED DESCRIPTION

### Embodiment 1

**[0020]** A shell for heat-not-burn tobacco is provided, which is manufactured by a ceramic film paper tube, a ceramic film sealing paper located at one end of the tobacco tube and a filter tip located at the other end of the ceramic film tobacco tube.

**[0021]** Wherein the ceramic film paper tube is manufactured by the following method: firstly, coating a rough surface of 60-gsm paper for manufacturing a paper tube with clay for film forming so as to manufacture 65-gsm paper for manufacturing a ceramic film paper tube; then, the paper for manufacturing the ceramic film paper tube is used as the innermost layer of the shell for tobacco, and the paper for manufacturing the ceramic film paper tube is combined with 120-gsm paper for manufacturing a paper tube and 60-gsm paper for manufacturing a paper tube to be rolled into the ceramic film paper tube, wherein the ceramic film of the paper for manufacturing the ceramic film paper tube is contacted with the filled tobacco.

**[0022]** The ceramic film sealing paper is manufactured by the following method: firstly, coating the rough surface of 70-gsm base paper with a ceramic film, and coating the smooth surface of the base paper with an aluminum film to obtain 77-gsm film-coated paper; then, uniformly punching holes in the film-coated paper by adopting an infrared laser punching technology, with a hole diameter being 0.20 mm, a center distance of the holes being 0.50 mm, and a porosity being 12.6%, so as to form the ceramic film sealing paper. The ceramic film sealing paper manufactured by the method has excellent air permeability of through holes, so that suction smoothness can be ensured, without obvious obstruction.

**[0023]** The shell for heat-not-burn tobacco manufac-

ured in Embodiment 1 has the following advantages:

For the ceramic film paper tube, firstly, as the ceramic film paper tube is manufactured by three layers of paper for manufacturing a paper tube (namely 65-gsm paper for manufacturing a ceramic film paper tube, 120-gsm paper for manufacturing a paper tube, and 60-gsm paper for manufacturing a paper tube), the ceramic film paper tube is uniform in thickness and high in mechanical strength, and therefore it is not easy to bend, thereby being beneficial to mechanized production and subsequent use of tobacco; secondly, as the paper for manufacturing the ceramic film paper tube is coated with +5-gsm level of clay coated film, the wetness and moisture retention effects of the tobacco can be significantly realized for a long time, effective substances are balanced, the stability of components in the shell for tobacco is favorably adjusted, and the volatilization or deterioration of these components is significantly slowed down; and thirdly, the combination use of three layers of paper for manufacturing a paper tube (i.e., 65-gsm paper for manufacturing a ceramic film paper tube, 120-gsm paper for manufacturing a paper tube, and 60-gsm paper for manufacturing a paper tube) makes the thickness of the shell for heat-not-burn tobacco suitable, so that the shell will not be too thin to collapse, will help to keep the shape of the tobacco tube well and is not easy to bend or damage, will not generate the phenomena of scalding hands, and will not be too thick to increase the cost.

**[0024]** For the ceramic film sealing paper, firstly, as the +7-gsm level of clay coated film which is thicker than the +5-gsm level of clay coated film coating the paper for manufacturing a ceramic film paper tube is adopted, the moisture retention effect can be further improved, and thus the volatilization and deterioration of tobacco substances filled in the shell for heat-not-burn tobacco can be more effectively prevented; secondly, 77-gsm film-coated paper has ideal thickness, which can prevent the ceramic film sealing paper from being too thick, thereby being beneficial to the smooth puncture and insertion of an insertion type heater and preventing the ceramic film sealing paper from being too thin to be easily damaged by external force; thirdly, a proper porosity is selected, so that the tobacco substances in the shell for heat-not-burn tobacco cannot leak out while the ideal air permeability is ensured, and the suction smoothness in the whole tobacco tube can be ensured, and the use feeling is good and comfortable; and fourthly, the through holes are formed by adopting laser punching, and compared with mechanical punching, it is more uniform, and the velocity of punching is faster, without unnecessary processing waste material.

### Embodiment 2

**[0025]** A shell for heat-not-burn tobacco is provided, which is manufactured by a ceramic film paper tube, a ceramic film sealing paper located at one end of the tobacco tube and a filter tip located at the other end of the

ceramic film tobacco tube.

wherein the ceramic film paper tube is manufactured by the following method: firstly, coating a rough surface of 120-gsm paper for manufacturing a paper tube with a ceramic film so as to manufacture 122-gsm paper for manufacturing a ceramic film paper tube; then, the paper for manufacturing the ceramic film paper tube is used as the innermost layer of the shell for tobacco, and the paper for manufacturing the ceramic film paper tube is combined with 120-gsm paper for manufacturing a paper tube to be rolled into the ceramic film paper tube. The ceramic film sealing paper is manufactured by the following method: coating the rough surface of 80-gsm base paper with a ceramic film, and coating the smooth surface of the base paper with an aluminum film to obtain 85-gsm ceramic film sealing paper; and uniformly punching holes in the ceramic film sealing paper by adopting a needle roller mechanical punching technology, with a hole diameter being 0.20 mm, a center distance of the holes being 0.40 mm, and a porosity being 19.6%.

### Embodiment 3

**[0026]** A shell for heat-not-burn tobacco is provided, which is manufactured by a ceramic film paper tube, a ceramic film sealing paper located at one end of the tobacco tube and a filter tip located at the other end of the ceramic film tobacco tube.

wherein the ceramic film paper tube is manufactured by the following method: firstly, coating a rough surface of 50-gsm paper for manufacturing a paper tube with a ceramic film so as to manufacture 60-gsm paper for manufacturing a ceramic film paper tube; then, the paper for manufacturing the ceramic film paper tube is used as the innermost layer of the shell for tobacco, and the paper for manufacturing the ceramic film paper tube is combined with two layers of 80-gsm paper for manufacturing a paper tube to be rolled into the ceramic film paper tube. The ceramic film sealing paper is manufactured by the following method: coating the rough surface of 70-gsm base paper with a ceramic film, and coating the smooth surface of the base paper with an aluminum film to obtain 85-gsm ceramic film sealing paper, and punching pattern holes on the ceramic film sealing paper by utilizing the arrangement of punching needles of a needle plate and adopting a needle plate punching technology, with a hole diameter being 0.15 mm and a total porosity being 15.0%, so that through holes with good air permeability are formed, the suction is smooth, and the surface is attractive and neat.

**[0027]** The foregoing is only the best embodiments of the present invention. It should be emphasized that various modifications and improvements to the present invention, which may be made by those skilled in the art without departing from the inventive idea of the present invention, shall fall within the protection scope of the present invention.

### Claims

1. A ceramic film shell for heat-not-burn tobacco, comprising a main tobacco tube, a sealing paper located at one end of the tobacco tube and a filter tip located at the other end of the tobacco tube, wherein a ceramic film is arranged on a contact layer in contact with tobacco in the tobacco tube.
2. The ceramic film shell for heat-not-burn tobacco according to claim 1, wherein a ceramic film is arranged on a contact surface of the sealing paper and the tobacco.
3. The ceramic film shell for heat-not-burn tobacco according to claim 2, wherein the ceramic film sealing paper is a double-surfaced film-coated paper, namely, a ceramic film is arranged on one surface of the ceramic film sealing paper, and an impermeable film is arranged on the other surface of the ceramic film sealing paper, wherein the impermeable film is preferably an aluminum film.
4. The ceramic film shell for heat-not-burn tobacco according to claim 1, 2 or 3, wherein a gram weight of the ceramic film of the tobacco tube and the ceramic film of the sealing paper is 2-10 gsm.
5. The ceramic film shell for heat-not-burn tobacco according to claim 4, wherein a tipping paper is arranged on an outer surface of the tobacco tube provided with the ceramic film.
6. The ceramic film shell for heat-not-burn tobacco according to any one of claims 1 to 5, wherein the gram weight of the ceramic film of the sealing paper is greater than the gram weight of the ceramic film of the tobacco tube.
7. The ceramic film shell for heat-not-burn tobacco according to claim 6, wherein the tobacco tube is a paper tube manufactured by spirally rolling a plurality of layers of paper or a paper tube manufactured by directly rolling flat-plate cigarette paper.
8. The ceramic film shell for heat-not-burn tobacco according to any one of claims 1 to 7, wherein one surface of paper for manufacturing the tobacco tube is a smooth surface, the other surface of the paper for manufacturing the tobacco tube is a rough surface with certain roughness, and the ceramic film is arranged on the rough surface of the paper with the roughness; one surface of the ceramic film sealing paper is a smooth surface, the other surface of the ceramic film sealing paper has certain roughness to form a rough surface, the ceramic film is arranged on the rough surface of the paper with the roughness, preferably, a plurality of through holes are formed in

the sealing paper, and a porosity is not less than 4%, more preferably, the porosity is 12.6%.

9. The ceramic film shell for heat-not-burn tobacco according to any one of claims 1 to 8, wherein the ceramic film is a clay film, a porcelain film, a silicon film or a similar material film, and the color of the ceramic film is preferably milky white. 5
10. The ceramic film shell for heat-not-burn tobacco according to any one of claims 1 to 9, wherein the ceramic film paper tube is manufactured by rolling 65-gsm paper for manufacturing a ceramic film paper tube, 120-gsm paper for manufacturing a paper tube and 60-gsm paper for manufacturing a paper tube in a combined manner, the ceramic film sealing paper is manufactured by 77-gsm film-coated paper formed by coating a rough surface of 70-gsm base paper with a ceramic film and coating a smooth surface of the base paper with an aluminum film, and holes are uniformly punched in the film-coated paper, with a hole diameter being 0.20 mm, a center distance of the holes being 0.50 mm, and a porosity being 12.6%. 10 15 20 25

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## INTERNATIONAL SEARCH REPORT

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<b>A. CLASSIFICATION OF SUBJECT MATTER</b>		
A24D 1/02(2006.01)i; A24D 1/20(2020.01)i; A24F 47/00(2020.01)i		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols)		
A24D A24F		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
CNABS; CNTXT; VEN; USTXT; EPTXT; WOTXT; CNKI; WEB OF SCIENCE: 加热不燃烧, 电子烟, 香烟, 烤烟, 烟纸, 纸, 陶瓷, 陶土, 硅晶, 封口, 封堵, 堵口, 隔热, 孔, cigarette, wrap+, smok+, insulating layer, aerosol, argilla, pot clay, pottery, porcelain, ceramics, seal		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Y	CN 109527639 A (CHINA TOBACCO ANHUI INDUSTRIAL CO., LTD.) 29 March 2019 (2019-03-29) description, paragraphs [0006]-[0032], and figures 1 and 2	1-10
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* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
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**INTERNATIONAL SEARCH REPORT**  
**Information on patent family members**

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