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(54) **Tobacco slab**

(57) The invention relates to a continuous tobacco slab (10) made of shredded tobacco which slab has a substantially uniform composition and a substantially uniform distribution of the shredded tobacco. The invention further relates to a multi-layer structure comprising the

tobacco slab and in addition at least one layer, preferably one or two layers, of a smokable material other than shredded tobacco. Furthermore, the invention provides a package comprising the tobacco slab or multi-layer structure.

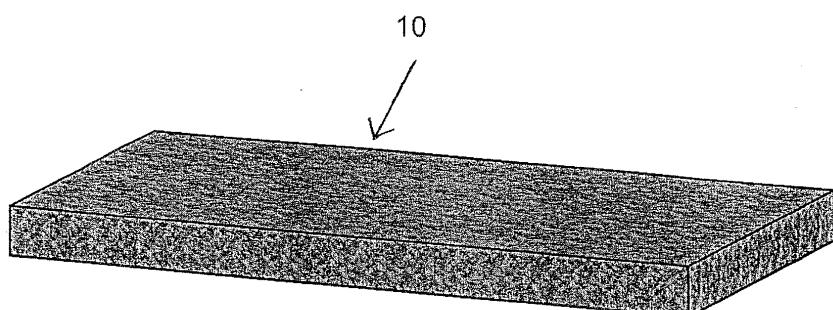


Fig. 1

Description

[0001] The present invention relates to a tobacco slab, a process for making such tobacco slab and a package comprising such tobacco slab.

[0002] Pre-formed pieces of tobacco are known in the art. For example, US-A-1,365,969 discloses a plug of tobacco for chewing or pipe smoking. The plug is composed of a densely compacted filler of 'long-cut' tobacco enclosed in leaf tobacco wrapper. For use, sections or slices of tobacco are broken or cut off from the plug and manually brought into a sufficiently 'fluffy' condition suited for chewing or smoking. A disadvantage of the disclosed tobacco plug is that the tobacco is very densely compressed and requires manual manipulation before use.

[0003] EP-A-0 647 411 discloses a tobacco cuboid made of several pre-defined sub-portions. The tobacco cuboid is for a smoker's use to make his own cigarettes. The individual sub-portions are separated either by mechanical means, for example by cuts or grooves, or by separating webs made of a non-smokable material. The cuboid is made from a tobacco strand which is then cut into partial strands corresponding to the sub-portions. The coherence among the sub-portions is problematical.

[0004] DE-A-10346649 discloses tobacco portions made from a non-woven fabric containing at least 50 percent of tobacco. The non-woven fabric is a coherent, self-supporting web.

[0005] There is an increasing trend among smokers towards roll-your-own and make-your-own cigarettes. Roll-your-own cigarettes are made using fine cut tobacco which has a density in the range of about 60 mg/cm³ and is typically sold in reclosable, flexible plastic pouches. One of the disadvantages of the roll-your-own method is that it allows for cigarettes of variable tar and nicotine content. Make-your-own methods aim at overcoming this disadvantage by relying on pre-made or pre-defined tobacco portions which are transferred into pre-made tubes of cigarette paper, typically with a filter.

[0006] It is an object of the present invention to provide an improved tobacco material which can be used by a smoker to make his own cigarettes.

[0007] The present invention provides a continuous slab of smokable tobacco with a substantially uniform composition and distribution of shredded tobacco throughout the slab. In particular, the present invention provides a tobacco slab made of shredded tobacco characterized in that it is continuous and has a substantially uniform composition and a substantially uniform distribution of the shredded tobacco. As used herein, shredded tobacco includes cut tobacco. The tobacco slab of the invention enables the consumer to make his own cigarettes of consistent quality and smoking behavior.

[0008] The tobacco slab of the invention is obtainable by a process comprising the steps of filling a pre-defined amount of shredded tobacco into a suitable mold, evenly distributing the shredded tobacco in the mold and evenly compressing the shredded tobacco. Preferably, such

process further comprises the steps of removing the slab from the mold and transferring the slab into a package.

[0009] The slab according to the present invention is a continuous tobacco slab. The slab lacks any means or indications of pre-portioning or separation. In particular, the slab is devoid of any mechanical or physical means creating pre-portions, such as, for example, grooves, cuts or separating webs.

[0010] The tobacco slab according to the present invention is composed of shredded tobacco, preferably in cut filler form, for example blended, cased, cut and flavored tobacco. Preferably, the slab has a thickness of between about 6 mm and about 12 mm. The slab has a substantially uniform and homogeneous composition.

This facilitates the production of a uniform batch of self-made cigarettes with substantially consistent quality and smoking behavior under identical conditions.

[0011] The tobacco slab may comprise any desired quantity of shredded tobacco sufficient to make at least

two cigarettes. Preferably, the tobacco slab of the invention comprises at least about 3.5 g of cut filler, more preferably at least about 15 g of cut filler, most preferably between about 15 g and about 50 g of cut filler, which amount is evenly distributed across and throughout the slab.

If desired, the cut filler may comprise small amounts of one or more suitable non-tobacco additives, for example suitable particulate additives. Suitable additives are known in the art and have been disclosed for incorporation in the cut filler used in the tobacco rod of pre-manufactured cigarettes. Such additives include, for example, additives, such as nanoparticle additives, which during smoking of the cigarette are capable of acting as oxidants for the conversion of carbon monoxide to carbon dioxide or as catalysts for the conversion of hydrocarbons, aldehydes, or phenolic compounds to carbon dioxide and water.

[0012] The shredded tobacco is substantially uniformly distributed across the slab. The tobacco density is a function of tobacco weight and compression. As compared to loose cut filler, the cut filler in the slab is moderately compressed, that is the tobacco essentially retains its natural flexibility and elasticity after compression. Preferably, the cut filler in the slab is uniformly compressed by a factor of between about 2 and about 6, more preferably by a factor between about 2 and about 4, most preferably by a factor of between about 3 and about 4 as compared to loose cut filler of the same composition. The compression factor is essentially the same across and throughout the cut filler. Preferably, the cut filler in the slab has an average (filling) density between about 150 mg/cm³ and about 250 mg/cm³. The average filling density of the slab is calculated as the quotient of weight per volume. The person of ordinary skill in the art will readily appreciate that the density will be affected by various

parameters, including for example the type or types of tobacco and the amount of expanded tobacco employed in the cut filler. Preferably, the tobacco slab of the present invention has substantially the same firmness across the

slab.

[0013] The strand length or cutting width of the shredded tobacco in the tobacco slab of the present invention is relatively short and substantially the same as in conventional pre-fabricated cigarettes, for example between about 0.4 mm and about 0.9 mm. Preferably, the cutting width of the cut filler is between about 0.6 mm and about 0.8 mm.

[0014] Preferably, the tobacco slab according to the present invention does not include any outer or inner binding agent such as, for example, combustible fibers like cellulose or other natural materials woven into the tobacco, agar agar, guar gum or cellulose pulp.

[0015] The continuous tobacco slab of the present invention is of pre-defined shape and size. Preferably, shape and size are such that the slab yields at least two, preferably at least five, more preferably between 20 and 40 cigarettes of a standard length and diameter, for example conventional king size. Typically, the dimensional parameters of the final cigarette, and hence of the slab, will be determined by the size of the commercially available, pre-manufactured cigarette paper tubes. In particular, height and width of the slab are such that the consumer can readily make his own cigarettes, for example conventional king size filter cigarettes, relying on commercially available cigarette paper tubes. To minimize or avoid tobacco waste, the width of the slab essentially corresponds to the length of such tubes (excluding the filter). If desired, the width of the slab may slightly exceed the filling length of the tubes by up to about 10 percent, or less. While the tobacco slab may be of any shape, the shape should be such as to minimize waste in use, for example on a cigarette making device. Preferably, the slab has the shape of a rectangular parallelepiped with a height of between about 6 mm and about 12 mm, preferably of between about 8 mm and about 12 mm. Preferably, the slab width is between about 65 mm and about 80 mm. The slab length is not crucial and may vary depending on the number of cigarettes the block is intended to yield. Advantageously, the slab length is between about 75 mm and about 200 mm. The maximum slab length may favorably be matched with the design of the cigarette making device, which the smoker may use to produce self made cigarettes using the tobacco slab of the present invention. To avoid cigarettes with loose ends, the tobacco slab does not flatten towards its edges.

[0016] If desired, the slab may be designed such that its height or its cut filler density, or both, are slightly increased along one or more pre-defined edges, preferably along the two edges determining the slab width. The increased height and/or density along at least one pre-defined edge may serve to facilitate transfer of the slab, for example into the package or, in particular, transfer into and through a cigarette making device. Preferably, the density is suitably increased along one side surface while the slab height is kept constant across the slab.

[0017] In a preferred aspect, the present invention provides a tobacco slab essentially consisting of shredded

tobacco, preferably in cut filler form. Preferably, the tobacco slab has a density of between about 200 mg/cm³ and about 250 mg/cm³, more preferably between about 220 mg/cm³ and about 240 mg/cm³. Advantageously, the total water content of the slab is between about 12 and about 16 percent. Preferably, the cut filler does not comprise any non-tobacco particulate additives. Preferred is such tobacco slab consisting of cut filler which slab has one or more of the features indicated herein as being preferred.

[0018] Such tobacco slab may be made using a mold comprising a bottom (or top) wall and four side walls. The plan of the mold substantially corresponds to the plan of the tobacco slab to be produced. Advantageously, mold length and width are slightly smaller, for example less than a few millimeters smaller, than width and length of the desired slab. The side walls of the mold must be high (deep) enough so that the mold can readily accommodate the chosen amount of loose cut filler. For example, the mold should be about 4 to about 5 times higher, than the desired height of the slab. The mold may be made of any suitable material, such as steel. To facilitate removal of the slab from the mold, for example by pushing, the mold is preferably made of or coated with a material which does not stick to cut tobacco, for example a suitable plastic material, and which is approved for use with food. The mold is uniformly filled with the desired amount of cut tobacco. Subsequently, the cut filler in the mold is evenly compressed by application of a pre-determined external pressure to yield a tobacco slab of pre-defined shape and dimensions. The external pressure may be applied, simultaneously or successively, to one or more surfaces of the slab. Suitable compression tools and methods are readily known in the art. For example, a pre-defined pressure may be exerted by means of a rigid plate which may be moved mechanically or pneumatically. Preferably, compression is such that the height of the compressed slab is about 1 to 3 mm less than the desired final height of the slab. Immediately after the pressure has been released the slab is transferred into a suitable package as described herein below. Preferably, this transfer involves sliding and/or pushing the slab by mechanical means. The transfer is performed such that the geometrical shape and the integrity of the tobacco slab including its density, uniformity and distribution are substantially maintained. Advantageously, the mold may have one or two removable side walls to facilitate pushing and sliding the slab out of the mold. Alternatively, the mold may have a bottom wall which can be suitably raised or lowered to facilitate transfer of the slab out of the mold. In the package, the slab may slightly expand until it fills the available pack volume assuming its desired final dimensions.

[0019] Alternatively to the above described sequential process, the slabs according to the invention may also be made in a continuous process, for example, by cutting slabs of the desired size from a continuous strand.

[0020] The tobacco slab obtainable according to the

process of the invention is not a self-supporting non-woven fabric as disclosed in DE-A-10346649. But the present invention provides a tobacco slab made of shredded tobacco characterized in that it is continuous and has a substantially uniform composition and a substantially uniform distribution of the shredded tobacco which slab is obtainable by a process comprising the steps of filling a pre-defined amount of shredded tobacco into a mold, evenly distributing the shredded tobacco within the mold and evenly compressing the shredded tobacco by exertion of a pre-defined pressure and which slab excludes a self-supporting non-woven fabric. The tobacco slab as provided herein is a non-self supporting structure which loses its dimensional integrity and stability without proper support. Means supporting the slab are essential during its manufacture, transportation, storage and handling. In particular, the slab has very little tensile strength.

[0021] A method suitable to determine that a given slab is not self-supporting and thus a tobacco slab according to the invention is a 'lifting test'. The test involves a tobacco slab made of 23 g of cut filler having a width of 73 mm, a height of 11 mm and a length 144 mm. The slab is carefully removed from its package, transferred onto a flat support, such as a table, and lifted with only two fingers. No other supporting means for the slab is involved during the lifting. For example, the slab may be taken up and lifted from a supporting surface by partially or entirely covering the right and left side surfaces (corresponding to the slab width) with the index fingers of each hand. Alternatively, the slab may be seized between the thumb and the index finger of the same hand and lifted. On exposure to such test a non-self-supporting tobacco slab according to the invention will lose its dimensional integrity, that is it will break and fall apart.

[0022] In another preferred aspect, the present invention provides a multi-layer structure comprising a tobacco slab according to the invention and in addition at least one layer, preferably two layers, of another suitable smokable material approved for use in cigarettes. For example, such suitable smokable materials include paper made of natural fibers, for example tobacco fibers, and reconstituted tobacco sheet. A preferred material is top loaded reconstituted tobacco sheet. Such material is known in the art and may be made as described in WO-A-03/082030. Preferred is such multi-layer structure comprising at least one layer of another smokable material. Advantageously, such at least one layer forms an outer surface of the multi-layer structure providing for a relatively smooth outer surface of the structure and reducing sliding friction and/or static (sticking) friction as compared to the out surface of the tobacco slab. Such layer thus facilitates transfer of the structure, for example into or out of the pack. Advantageously, the layer or layers self-adhere to the tobacco slab without additive. The features of the slab indicated above, in particular those described as preferred and in particular those of weight, width, length and average density, also apply for such multi-layer structures. While the multi-layer structure pro-

vided herein may or may not be self-supporting, the tobacco slab component of such structure is not self-supporting.

[0023] A preferred embodiment has a sandwich type, multilayer structure, more preferably a three layer structure. Most preferably, such three layer structure is a symmetrical structure wherein the top layer is made of the same material as the base layer. Particularly preferred is a tobacco structure which is composed of a base layer of smokable material (other than solely cut filler), a middle layer of cut filler (i.e. of a tobacco slab according to the invention) and a top layer of smokable material (other than solely cut filler). Typically, the front, the back and the side surfaces of the cut filler middle layer are not covered or enclosed by the other smokable material used in another layer of a multi-layer structure. Advantageously, the base and top layers are each made of the same smokable material, preferably reconstituted tobacco sheet, more preferably top loaded reconstituted tobacco sheet. In the latter embodiment, the cut filler top loads advantageously face towards the cut filler middle layer. The top and base layers each have a thickness of about 0.5 mm to about 2 mm while the cut filler middle layer has a thickness of about 6 mm to about 10 mm.

[0024] Typically, the amount of reconstituted tobacco comprised in the tobacco slab or the multi-layer structure according to the invention (in sheet form and/or in the cut filler) is limited. The total amount of reconstituted tobacco must not exceed the upper limit as defined in the applicable regulatory standard.

[0025] A multi-layer structure comprising the tobacco slab and at least one layer, preferably two layers, of another suitable smokable material may be produced using the tools and methods as described above. For example, to produce a three layer tobacco structure as described above the bottom of a suitable mold, such as a mold as described above, is laid out with a sheet of reconstituted tobacco. Advantageously, the size of the sheet is such that it covers the entire surface of the mold bottom. Subsequently, the mold is filled with a defined amount of cut filler as described above. After covering the cut filler layer with another sheet of reconstituted tobacco, a defined pressure is applied to yield a tobacco structure with a compression factor and cut filler density which is slightly higher than the compression factor and density desired for the final multi-layer structure.

[0026] In yet another aspect, the present invention provides a package comprising the continuous tobacco slab or the multi-layer structure of the invention. In the following the slab and the multi-layer structure are referred to as the "product". Such pack may be made of any suitable material or combination of materials, including, for example but not limited to carton, cardboard, metal or plastic. Preferably, the package is a rigid pack which tightly encloses the product. The rigid pack of the invention may be composed of one, two or more parts. The pack has a pre-defined three-dimensional shape which is selected such as to match and support the final three-dimensional

shape of the product. An appropriate shape and sufficient rigidity of the pack are essential to retain crucial product properties, including shape, dimension and density of the tobacco product, in particular the tobacco slab. This means that the packaged product should substantially retain its shape, dimension and density during all further manipulation until consumption including transportation and storage. For example, a cardboard pack with a grammage of between about 220 g/m² and 300 g/m² is sufficiently rigid. Advantageously, one or more of the pack surfaces facing the tobacco product are partially or fully coated with a material which is approved for use with food and suitable to reduce or minimize friction upon removal or insertion of the product. Furthermore, the package will support the freshness of the tobacco product and prevent its drying out. Particularly preferred is a pack made of cardboard whose inner surfaces are completely coated with aluminum foil.

[0027] While size and shape of the pack may be such to accommodate more than one tobacco product, preferred is a pack containing one piece of product.

[0028] A preferred pack of the invention is a slide and shell type pack which comprises an inner sleeve and an outer sleeve. The inner sleeve directly circumscribes or encloses the tobacco product. Preferably, the inner sleeve is designed such that it covers four outer surfaces of the product including the two major outer surfaces of the product, in particular its top, bottom, front and rear surfaces. The front and rear surfaces are determined by the product length. The two side surfaces of the product (determined by the product width) are not covered by the inner sleeve. Preferably, the outer sleeve is designed such that it directly circumscribes the inner sleeve with the tobacco product and covers the two product side surfaces which are not covered by the inner sleeve. Preferably, the outer sleeve covers the side surfaces determined by the product width and the top and the bottom surfaces of the inner sleeve. In use, the consumer removes the outer sleeve by pushing the inner sleeve circumscribing the tobacco product out of the outer sleeve. Preferably, the outer and the inner sleeve are both made from rigid cardboard. If desired, the inner surfaces of the sleeves, in particular the inner surface of the inner sleeve, may be partially or entirely coated with another material or metallized suitable to reduce friction. Suitable coating materials are readily known in the art and include those disclosed for use in cigarette paper tubes. A particularly preferred pack according to the invention is a slide and shell pack wherein the inner and outer sleeves are made of aluminum laminated cardboard with a total grammage in the range of between about 220 g/m² and about 300 g/m², for example with a total grammage of 275 g/m² (250 g/m² for the cardboard; 25 g/m² aluminum foil). Reduction of friction facilitates the removal of the outer sleeve or pushing the tobacco product out of the inner sleeve without breakage. Preferably the dimensions of the inner sleeve correspond to the desired product dimensions. Optionally, the package may comprise an in-

ner frame.

[0029] Advantageously, the package further comprises an outer wrapper to preserve freshness of the tobacco product and prevent drying out. Suitable wrappers are known in the industry and include wrappers from materials which are currently used to wrap cigarette packs or cartons, such as polypropylene. The outer wrapper may include means facilitating its removal, such as a tear tape.

[0030] In yet another aspect, the present invention provides a container designed to hold several, for example up to ten, packs comprising a tobacco product according to the present invention.

[0031] To make his own cigarettes starting from a continuous tobacco product of the invention, the consumer may use a cigarette making device to facilitate transferring a suitably sized piece of the slab or the multi-layer structure into a pre-made cigarette tube. Optionally, such tube comprises a filter, preferably a ventilated filter.

[0032] For example, a device suitable for use with the tobacco slab or multilayer structure according to the present invention comprises a portioning means, a separating means such as a knife suitable to separate a portion of tobacco from the slab or multi-layer structure, a transportation means to move the slab or multilayer structure towards the separating means by a defined distance and a filling means to fill the portion into the pre-made cigarette tube. During this procedure the making device, the pack or both support the integrity of the tobacco slab or multi-layer structure during the process. Advantageously, the pack comprising the tobacco product is inserted in the cigarette making device. In use, the tobacco product is moved out of the pack portion by portion. Since the tobacco slab according to the invention has a substantially uniform tobacco density across the whole volume of the block, each portion of the same size contains substantially the same amount of tobacco.

[0033] Embodiments of the invention will now be described, by way of example only, and with reference to the accompanying drawings, in which:

Figure 1 shows a continuous tobacco slab 10 consisting of one layer of cut filler;
 Figure 2 shows a continuous three-layer sandwich structure 20 wherein the base layer 12 and the top layer 14 each are a sheet of reconstituted tobacco, and the middle layer is a tobacco slab 10 of cut filler.

[0034] The continuous tobacco slab 10 in Figure 1 shows a continuous tobacco slab 10 of the invention consisting of a single layer of cut filler. The slab 10 has a width of 73 mm, a height of 8 mm and a length of 140 mm. It is made of 24 g of cut filler and has an average filling density of about 235 mg/cm³. The slab may yield at least 30 cigarettes. The cutting width of the cut filler is 0.65 mm.

[0035] The continuous sandwich structure 20 in Figure 2 has three layers and consists of a 0.5 mm base layer

12 made of top loaded reconstituted tobacco sheet, a 9 mm tobacco slab 10 made of cut filler and a 0.5 mm top layer 14 of top loaded reconstituted tobacco sheet. The cut filler top loads of the base layer 12 and the top layer 14 each face towards the cut filler middle layer 10. The weight of the structure is 24 g, the average density is about 240 mg/cm³.

Claims

1. A continuous tobacco slab (10) made of shredded tobacco obtainable by a process comprising the steps of

- filling a pre-defined amount of shredded tobacco into a mold,
- evenly distributing the shredded tobacco within the mold and
- evenly compressing the shredded tobacco by exertion of a pre-defined pressure.

2. The tobacco slab (10) according to claim 1 wherein the shredded tobacco is in cut filler form.

3. The tobacco slab (10) according to any of the preceding claims which has an average density of between about 150 mg/cm³ and about 250 mg/cm³.

4. The tobacco slab (10) according to any of the preceding claims which has a width of between about 65 mm and about 80 mm.

5. A multi-layer structure (20) comprising a tobacco slab (10) according to any of the preceding claims and in addition at least one layer, preferably one or two layers, of a smokable material other than shredded tobacco which multi-layer structure is obtainable by the process of claim 1 comprising the additional step of adding at least one layer of smokable material other than shredded tobacco into the mold before and/or after filling the pre-defined amount of shredded tobacco into the mold.

6. The multi-layer structure (20) according to claim 5 which has an average density of between about 150 mg/cm³ and about 250 mg/cm³.

7. The multi-layer structure (20) according to claim 5 or claim 6 which has a width of between about 65 mm and about 80 mm.

8. The multi-layer structure (20) according to any of claims 5 to 7 which has a three layer structure wherein in the base layer (12) and the top layer (14) each consist of reconstituted tobacco sheet, preferably top loaded reconstituted tobacco sheet, and the middle layer (10) essentially consists of cut filler.

9. The tobacco slab (10) according to any of claims 1 to 4 or the multi-layer structure (20) according to any of claims 5 to 8 wherein the cut filler density is slightly higher along one or more, preferably two pre-defined edges.

10. A process for making a tobacco slab (10) made of shredded tobacco **characterized in that** it is continuous and has a substantially uniform composition and a substantially uniform distribution of the shredded tobacco or a multi-layer structure (20) comprising the tobacco slab (10) and in addition at least one layer, preferably one or two layers, of a smokable material other than shredded tobacco, said process comprising the steps of

- filling a pre-defined amount of shredded tobacco into a mold,
- evenly distributing the shredded tobacco within the mold,
- optionally adding at least one layer of smokable material other than shredded tobacco into the mold before and/or after filling a pre-defined amount of shredded tobacco into the mold,
- evenly compressing the shredded tobacco and optionally the at least one additional layer by exertion of a pre-defined pressure, and
- removing the slab (10) or the multi-layer structure (20) from the mold, and optionally
- transferring the slab (10) or the multi-layer structure (20) into a package.

11. A package comprising the tobacco slab (10) according to any of claims 1 to 4 and 9 or the multi-layer structure according to any of claims 5 to 9.

12. The package according to claim 11 which comprises an inner sleeve enclosing the tobacco slab (10) or the multi-layer structure (20) and an outer sleeve enclosing the inner sleeve.

13. A package comprising a tobacco slab (10) made of shredded tobacco which slab is continuous and has a substantially uniform composition and a substantially uniform distribution of the shredded tobacco, said package being **characterized in that** it has a pre-defined three-dimensional shape.

14. Use of the tobacco slab (10) according to any of claims 1 to 4 and 9 or the multi-layer structure (20) according to any of claims 5 to 9 in a cigarette making device for the preparation of make your own cigarettes.

15. Use of the tobacco slab (10) according to any of claims 1 to 4 and 9 or the multi-layer structure (20) according to claims 5 to 9 wherein the tobacco slab (10) or the multi-layer structure (20) is partially en-

closed by a package.

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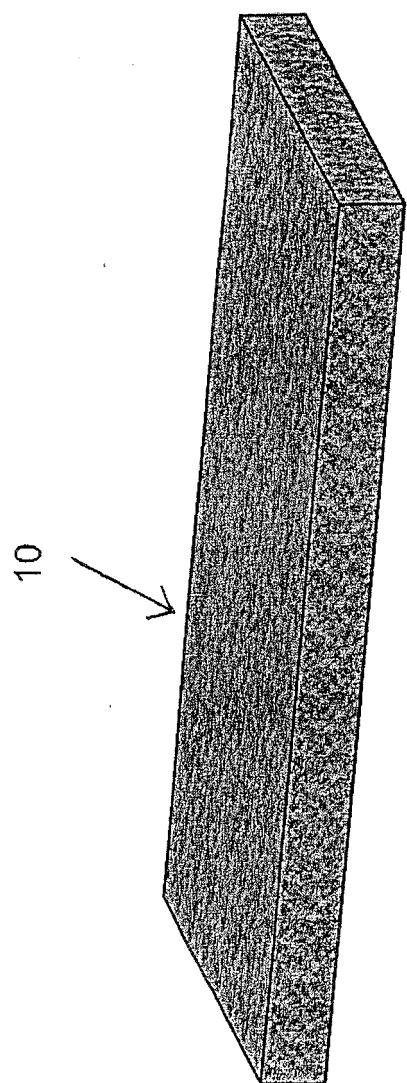


Fig. 1

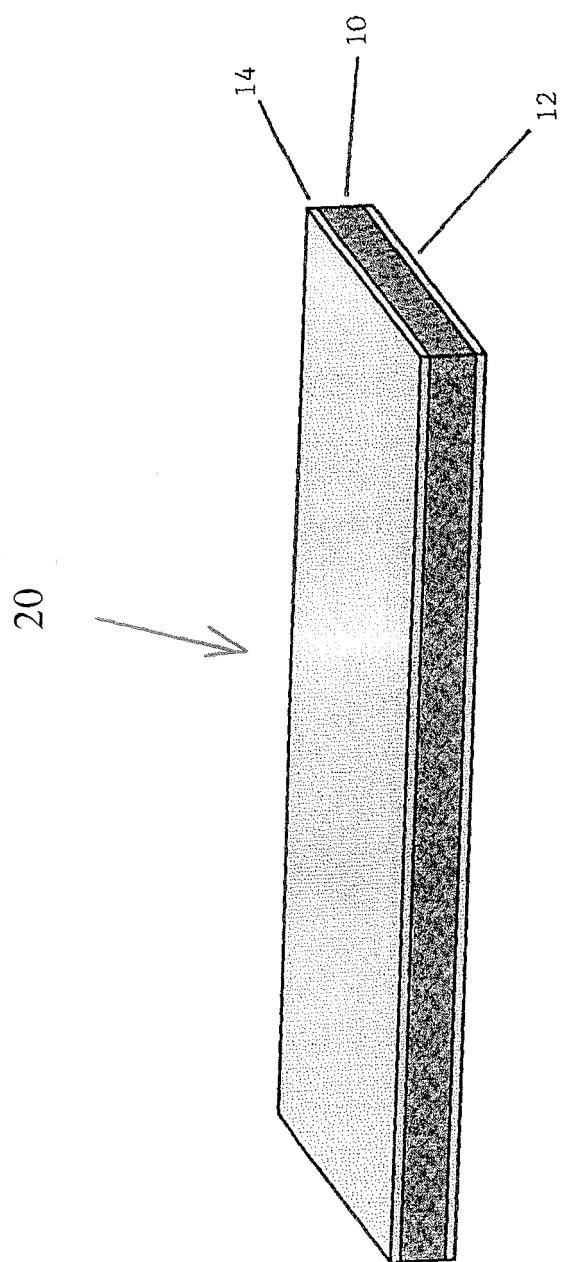


Fig. 2



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The present search report has been drawn up for all claims			
3	Place of search Munich	Date of completion of the search 6 November 2006	Examiner Maier, Michael
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			
T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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