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(54) **PROCESS AND ARRANGEMENT FOR PRODUCING AIRBORNE FIBRES**

VERFAHREN UND ANORDNUNG ZUR HERSTELLUNG IN DER LUFT SCHWEBENDER FASERN
PROCEDE ET AGENCEMENT DE PRODUCTION DE FIBRES AERIENNES

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(56) References cited:
GB-A- 2 124 264 **US-A- 3 653 094**
US-A- 4 315 347

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Description

TECHNICAL FIELD

[0001] The present invention relates to a process and an arrangement for producing airborne fibres from continuous lengths of thread bundles of fibre material.

BACKGROUND OF THE INVENTION

[0002] In the manufacture of absorbent articles such as diapers, incontinence pads, sanitary towels and the like, a number of different types of material are used made up of various types of synthetic fibres. The materials most commonly encountered are various types of so-called non-woven material, which are mainly used as liquid-permeable surface layers of absorbent articles. The liquid-permeable surface layers are arranged on that side of the article which in use is turned towards the user. Another common type of material made up of synthetic fibres are so-called waddings, which the user uses as insert material placed directly inside the liquid-permeable surface layer of the absorbent article and functioning as a first temporary storage material for the liquid getting into the article.

[0003] There are also other applications of synthetic fibre material in absorbent articles.

[0004] The basic material for the manufacture of synthetic fibre material for absorbent articles are continuous lengths of thread bundles (tow rope), which are cut to predefined lengths in a separate process before the non-woven material or the wadding can be manufactured. The cut fibres are then normally baled for delivery to a manufacturer of non-woven material or wadding material.

[0005] The patent WO-A1-93/11288 shows an arrangement for feeding thread bundles of synthetic fibre material to a cutting arrangement in which the thread bundles are cut to specific lengths.

[0006] Regardless of whether they go for non-woven manufacture or wadding manufacture, the fibres in the fibre bales are separated from one another in a first stage, following which the fibres are fed into a manufacturing process in which a so-called fibre layer is created. A common technique for creating a fibre layer is carding. The fibre layer is finally tied together by a suitable method, giving the non-woven material or the wadding its strength so that it can be handled and the material can be introduced into a machine for manufacturing absorbent articles, wound up on to a roll or the like.

[0007] Attempts have also been made to introduce fibres from fibre bales into an air flow and create a fibre layer on a vacuum wire, a so-called mat-former. The mat forming technique is a considerably easier and more robust technique than carding.

[0008] However, the technique has proved to be too rough and insensitive and major problems have occurred when the fibres in the bale must be separated from one

another without forming fibre flocks. Fibre flocks give rise to an uneven non-woven material or wadding material which does not function satisfactorily and is not aesthetically acceptable.

[0009] There is therefore a need for a process and an arrangement, which from a continuous length of a thread bundle of fibre material can produce airborne fibres with an even distribution of fibres in the air flow without a significant incidence of fibre flocks in the air flow, so that the robust mat-forming technique can be used in the creation of a fibre layer.

[0010] The object of the present invention is to meet this need.

15 SUMMARY OF THE INVENTION

[0011] This object is achieved by means of a process for producing a flow of airborne fibres, comprising the step of:

- a) a continuous length of a thread bundle of fibre material is fed from a stock of fibre material through a roll press, which rotates at a rate of feed and with the thread bundle held fast in the nip between its rollers, characterized by the roll nip being between the rollers of the roll press and by the further steps of;
- b) on emerging from the roll press, individual fibres are broken off from the thread bundle by means of a tearer,
- c) the individual fibres broken off by the tearer are carried away from the tearer by means of an air flow.

[0012] This process has proved to give a substantially more even distribution of fibres in the air flow, whilst the incidence of fibre flocks in the air flow is, by and large, negligible compared to previously known processes.

[0013] In a preferred embodiment the tearer comprises a rotating tearer and the tearer is rotated at a peripheral speed greater than 600 m/min, preferably greater than 1200 m/min and more preferably greater than 1500 m/min. The length of the airborne fibres is adjusted by varying the distance between the roll press and the tearer and the quantity of airborne fibres is adjusted by varying the speed of rotation of the roll press, that is to say by adjusting the input feed rate of the thread bundle.

The invention also relates to an arrangement for producing airborne fibres having a defined length distribution from a thread bundle of fibre material, characterized in that the arrangement comprises a stock of fibre material in the form of continuous lengths of thread bundles, a roll press with an inlet side for thread bundles and an outlet side, a tearer arranged adjacent to the outlet side of the roll press, a housing, which encloses the tearer and which comprises an opening on the side facing the outlet side of the roll press, and an air inlet and an air outlet arranged on opposite sides of the housing, and an element for producing an air flow through the housing from the air inlet to the air outlet.

[0014] In a preferred embodiment the rollers in the roll press have a series of axial ribs, evenly distributed along the circumference of the rollers and extending over the entire length of the rollers, the ribs on the one roller engaging in the intervals between the ribs on the second roller as the rollers rotate. The tearer preferably takes the form of a rotating tear roller and the arrangement advantageously has elements for moving the roll press in a radial direction relative to the tear roller. The element for producing an air flow through the housing from the air inlet to the air outlet may comprise a blower, the outlet side of which is connected to the air inlet of the housing.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] The invention will now be described with reference to drawings attached, of which:

Fig. 1 shows a diagrammatic side view of an arrangement according to a preferred embodiment of the invention connected to a mat-former wheel,
 Fig. 2 shows a diagrammatic perspective view of the roll press forming part of the arrangement according to Figure 1, and,
 Fig. 3 shows the shape of the teeth in the tearer forming part of the arrangement according to Figure 1.

DESCRIPTION OF EMBODIMENTS

[0016] Figure 1 shows a diagram of an arrangement for air-depositing a layer of synthetic fibres, taken from a storage reel 1 of a continuous length 2 of a thread bundle of such fibres, a so-called tow rope, on to a mat-former 3. Such layers of fibres are suitable as insert layer in absorbent products, such as sanitary towels, diapers and the like. The arrangement comprises a roll press 4, which feeds the thread bundle length 2 to a tearer 5, such as a tearer from Zuiko, for example. The tearer 5 is located inside a housing 6, which has an inlet feed opening, through which the tow rope 2 runs. The housing furthermore has an air inlet 7 and air outlet 8 arranged in two opposite walls, which in the embodiment shown extend at right angles to the wall containing the inlet feed opening. The outlet side of a blower 9 is connected to the air inlet 7 of the housing and an outlet funnel 10 extends from the air outlet 8 of the housing to just outside the peripheral surface of the mat-former 3. Alternative locations of the air inlet and air outlet are also conceivable.

[0017] Figure 2 shows a diagrammatic perspective view of the roll press 4. As will be seen from this figure, the rollers 11, 12 forming part of this roll press have ribs running axially, which extend over the entire length of the rollers and are evenly distributed along the circumference of the rollers. The rollers 11, 12 are furthermore arranged so that, as the rollers rotate, the ribs 13 of the one roller extend in the intervals between the ribs 13 of the second roller. The bearing surface between the tow rope and the

peripheral surfaces of the rollers will thereby be relatively large whilst the tow rope winds through the roll nip between the rollers 11, 12 in the roll press 4. The tow rope is thereby held so hard fast between the rollers that the fibres are torn off without the tow rope slipping between the rollers.

[0018] The tearer 5 shown in diagrammatic form in Figure 1 comprises a rotatable cylindrical tearer of a type similar to that used in the carding of fibre material. Such a tearer has a toothed, continuous wire wound around the periphery of the cylinder over the entire length of the cylinder. Figure 3 shows a typical profile of such a wire. The wire has a width of 0.5-1 mm, which means that the inclination of the wire turns in the transverse direction of the cylinder produced by the winding will be relatively small. Such a tearer typically has between 60 and 120 tooth points/cm². During operation of the arrangement the tearer 5 rotates with a high peripheral speed that far exceeds the rate of feed of the tow rope. The rotational speed of the tearer is greater than 600 m/min, preferably greater than 1200 m/min and more preferably greater than 1500 m/min. The high peripheral speed of the tearer means that the tow rope is not drawn off but broken/torn off.

[0019] The arrangement functions so that the teeth of the tearer take hold of the tow rope, which is being fed out from the roll nip between the rollers 11, 12, and tear off the threads in the tow rope. Because the tearer has a high tooth density, individual fibres will be torn off. The fibres torn off are then blown off the teeth of the tearer and transported away by the air flow generated by the blower 9 through the outlet funnel 10 to the mat-former wheel 3, the fibres being collected in the air-permeable moulds, which extend along the periphery of the mat-former wheel. A negative pressure normally prevails under the bases of these moulds.

[0020] Due to the fact that the peripheral speed of the tearer is much higher than that of the rollers 11, 12, the tow rope may be regarded as stationary in relation to the tearer at the instant of tearing. The threads of the tow rope are moreover held securely fast in the roll nip between the rollers 11, 12, so that they cannot slip in relation to the rollers or be stretched in the roll nip.

[0021] After passing through the roll press 11, 12, the continuous fibre threads are exposed to the air flow caused by the high speed of rotation of the tearer 5. The air flow deflects the fibres in the direction of the air flow and each individual fibre oscillates freely to and fro in the air flow until it encounters the teeth of the tearer. The length of each individual fibre thread when it encounters one of the teeth of the tearer varies, and depends primarily on how long the fibre thread in question can oscillate freely in the air flow from the tearer 5 before it encounters the surface of the tearer 5, that is to say the time it spends in the housing 6.

[0022] Important parameters that affect the time spent by the individual fibre threads before they are encountered by the tearer 5 and hence their length are the dis-

tance between the roll press 11, 12 and the tearer 5, the speed of rotation of the tearer 5 and the strength of the air flow formed thereby, the inlet feed speed of the roll press 11, 12 and variations in the stiffness of different fibre threads.

[0023] When one of the teeth of the tearer finally encounters the fibre thread, the fibre thread is broken off at the point of impact due to the great force and the rapid sequence with which the tearer 5 acts on the fibre thread.

[0024] The length of a fibre torn off therefore depends on a number of parameters, but the most important of these is the more or less random parameter of how much time it spends in the housing 6 without being encountered by the tearer 5.

[0025] With regards to the fibre length distribution, the fibres torn off can be divided into three main categories.

[0026] The first category comprises fibre threads that are relatively short. These short fibres have been torn off from the continuous thread bundle, that is to say encountered by the tearer 5 after spending a relatively short time in the housing 6. The category contains an estimated 25% of the total proportion of fibres torn off.

[0027] The second category, representing approximately 50% of the fibres torn off, consists of fibres that have been torn off from the thread bundle after a slightly longer length of time.

[0028] The third category consists of longer fibres with greater variations in length. A relatively longer time has probably elapsed before the tearer managed to take hold of these fibres. The proportion of fibres in this third category is approximately 25% of the total quantity of fibres. This mixing of longer fibres has a positive impact on the quality of the fibre layer to be created, since a certain admixture of the long fibres acts as effective reinforcement for the fibre layer created.

Typical fibre lengths in category one (short fibres) are 5-40 mm, in category two 40-70 mm and in category three 70-150 mm (polyester fibres).

[0029] Other fibre length distributions can naturally also be produced by modifying the distance between the rollers 11, 12 and the tearer.

[0030] In certain applications it may be advantageous to produce greater fibre length variations than the natural variations described above, which can be achieved in a number of ways.

[0031] One way is to make the diameter of the tearer 5 vary over its axial extent, so that the distance between the roll press 11, 12 and the tearer 5 varies in an axial direction. The fact that the distance between the roll press 11, 12 and the surface of the tearer 5 varies over the axial extent of the tearer means that the time spent by fibre threads in the housing 6 before they are encountered by the tearer 5 will also vary depending on where over the width the fibre threads are fed into the housing 6, that is to say the inlet feed position of the fibre threads in relation to the tearer 5.

[0032] Another way of producing fibre length variations is to use separate air flows in order to actively control the

length of time that the fibre threads spend in the housing 6 before the teeth of the tearer 5 get hold of the fibre threads. The control can be exercised by means of air jets arranged in the upper part of the housing 6, air flows being created which are superimposed on air flows caused by rotation of the tearer 5. The tow rope is thereby deflected so that the time which the fibre threads spend in the housing 6 before being encountered by the teeth of the tearer 5 is adjusted. Jets can be arranged so that only a limited part of the width of the tow rope is guided, whilst other parts are not guided. It is also possible to arrange a plurality of jets providing air flows in different directions, certain jets guiding certain parts of the width of the tow rope, so that the time spent before contact with the teeth of the tearer 5 is reduced, and other jets providing air flows which prolong the time spent.

[0033] A further advantage of additional deflection air from jets as described above is that it also has a cooling effect on the equipment.

[0034] It has been shown that the method described above for producing airborne fibres from tow rope and air-depositing the fibres, produces air-deposited fibre layer with a very well defined distribution of fibres in the layer. Furthermore, very few if any flocks occur in the layer. The method described is very easy to perform in comparison with the present carding technique. It is not entirely clear why the method described leads to such a good result. One contributory reason, however, is probably the fact that an effective separation of the fibres occurs at the instant of tearing and that the fibres are thereafter kept separate from one another until the fibre layer is created. Another contributory reason may be that, because the threads are stretched before the fibres are torn off, each fibre torn off has, from the outset, a well defined direction perpendicular to the direction of rotation of the tearer. Furthermore, the interval between the tearings may reduce the risk of fibres subsequently torn off catching in fibres torn off earlier and forming flocks.

[0035] Various additional material can easily be mixed into a fibre layer manufactured by the method described. Examples of additional material are other grades of fibres, highly absorbent gel-forming polymers in granulate form, so-called super-absorbent materials or the like. The admixture is suitably undertaken after the fibres have passed through the tearer, in connection with the air flow that is generated by the blower 9. The admixture can be arranged anywhere between the blower 9 and the mat former 3.

[0036] The embodiment described can naturally be modified without departing from the scope of the invention. For example, the tow rope may be arranged in some way other than on a storage reel, for example laid in a container. The ribs on the rollers forming part of the roll press may have some other cross-section, the tops, for example, being advantageously rounded. The air flow may be produced by means of a vacuum instead of a blower. The housing that encloses the tearer may have another shape, being designed, for example, to narrow

towards the air outlet. Furthermore, other types of tearer may be used, and the roll press may be designed in some other way in order to hold the tow rope securely fast in its roll nip, being designed, for example, to press the tow-rope against the periphery of one of the rollers in the roll press, in order to increase the bearing surface of the tow rope against this roller. In addition, the roll press may advantageously be displaceably supported so that the distance between the rollers and the periphery of the tearer is adjustable. It is also possible to provide the rollers and the tearer with a width such that a plurality of tow ropes arranged side by side with one another can pass through the arrangement simultaneously. The invention must therefore only be limited by the content of the claims attached.

Claims

1. Process for producing a flow of airborne fibres, comprising the step of:

(a) a continuous length (2) of a thread bundle of fibre material is fed from a stock (1) of fibre material through a roll press (4), which rotates at a rate of feed and with the thread bundle held fast in the nip between its rollers (11, 12), **characterized by** the roll nip being between the rollers (11, 12) of the roll press (4) and by the further steps of;

(b) on emerging from the roll press (4), individual fibres are broken off from the thread bundle by means of a tearer (5),

(c) the individual fibres broken off by the tearer are carried away from the tearer by means of an air flow.

2. Process according to Claim 1, **characterized in that** the tearer (5) comprises a rotating tearer and that the tearer (5) is rotated at a peripheral speed greater than 600 m/min, preferably greater than 1200 m/min and more preferably greater than 1500 m/min.

3. Process according to Claim 2, **characterized in that** the length of the airborne fibres is adjusted by varying the distance between the roll press (4) and the tearer (5).

4. Process according to Claim 2 or 3, **characterized in that** the quantity of airborne fibres is adjusted by varying the speed of rotation of the roll press (4).

5. Arrangement for producing airborne fibres having a defined length distribution from a thread bundle (2) of fibre material, **characterized in that** the arrangement comprises a stock (1) of fibre material in the form of continuous lengths (2) of thread bundles, a roll press (4) comprising rollers (11, 12), with an inlet

side for thread bundles and an outlet side, a tearer (5) arranged adjacent to the outlet side of the roll press, a housing (6), which encloses the tearer and which comprises an opening on the side facing the outlet side of the roll press, and elements (7, 8, 9) for producing an air flow through the housing (6).

6. Arrangement according to Claim 5, **characterized in that** the elements for producing an air flow through the housing (6) comprise an air inlet (7) and an air outlet (8) arranged at opposite sides of the housing (6), and element (9) for producing an air flow through the housing from the air inlet to the air outlet.

7. Arrangement according to Claim 5 or 6, **characterized in that** the rollers (11, 12) in the roll press (4) have a series of axial ribs (13), evenly distributed along the circumference of the rollers and extending over the entire length of the rollers, the ribs (13) on the one roller engaging in the intervals between the ribs (13) on the second roller as the rollers rotate.

8. Arrangement according to Claim 5, 6 or 7, **characterized in that** the tearer (5) comprises a rotating tear roller.

9. Arrangement according to Claim 8, **characterized in that** the arrangement comprises elements for moving the roll press (4) radially in relation to the tear roller (5).

10. Arrangement according to any of Claims 5 to 9, **characterized in that** the element for producing an air flow through the housing from the air inlet to the air outlet comprises a blower (9), the outlet side of which is connected to the air inlet (7) of the housing.

Patentansprüche

1. Verfahren zum Herstellen einer Strömung luftgetragener Fasern umfassen den Schritt:

(a) Fördern eines Fadenbündels aus Fasermaterial mit kontinuierlicher Länge (2) aus einem Ganzstoff (1) aus Fasermaterial durch eine Walzenpresse (4), die sich in einer Fördergeschwindigkeit dreht, wobei das Fadenbündel fest im Spalt zwischen den Walzen (11, 12) gehalten ist, **gekennzeichnet dadurch, dass** der Walzenspalt zwischen den Walzen der Walzenpressen ausgebildet ist und durch die weiteren Schritte:

(b) Lösen einzelner Fasern von dem Fadenbündel, das aus der Walzenpresse (4) tritt mittels eines Abreißers (5),

(c) Wegfördern der einzelnen Fasern, die durch den Abreißer gelöst wurden, von dem Abreißer

mittels einer Luftströmung.

2. Verfahren nach Anspruch 1, **dadurch gekennzeichnet, dass** der Abreißer (5) einen drehbaren Abreißer umfasst und dass der Abreißer (5) mit einer Umfangsgeschwindigkeit gedreht wird, die größer ist als 600 m/min, vorzugsweise größer als 1200 m/min und am meisten bevorzugt größer als 1500 m/min. 5
3. Verfahren nach Anspruch 2, **dadurch gekennzeichnet, dass** die Länge der luftgetragenen Fasern durch Variieren des Abstands zwischen der Walzenpresse (4) und des Abreißers (5) eingestellt wird. 10
4. Verfahren nach Anspruch 2, **dadurch gekennzeichnet, dass** die Menge der luftgetragenen Fasern durch Variieren der Rotationsgeschwindigkeit der Walzenpresse (4) eingestellt wird. 15
5. Anordnung zum Herstellen luftgetragener Fasern mit einer definierten Längerverteilung aus einem Fadenbündel (2) aus Fasermaterial, **dadurch gekennzeichnet, dass** die Anordnung einen Ganzstoff (1) aus Fasermaterial in Form von Faserbündeln mit kontinuierlicher Länge (2), eine Walzenpresse (4) umfassend Walzen (11, 12) mit einer Eintrittsseite für die Fadenbündel und einer Austrittsseite, einen Abreißer (5), der benachbart der Austrittsseite der Walzenpresse angeordnet ist, ein Gehäuse (6), das den Abreißer umschließt und eine Öffnung auf der Seite umfasst, die der Austrittsseite der Walzenpresse zugewandt ist und Elemente (7, 8, 9) zum Erzeugen einer Luftströmung durch das Gehäuse (6) umfasst. 20
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6. Anordnung nach Anspruch 5, **dadurch gekennzeichnet, dass** die Elemente zum Erzeugen einer Luftströmung durch das Gehäuse (6) einen Lufteintritt (7) und einen Luftaustritt (8) umfassen, die an entgegengesetzten Seiten des Gehäuses (6) angeordnet sind und dass sie ein Element (9) zum Erzeugen einer Luftströmung durch das Gehäuse vom Lufteintritt zum Luftaustritt umfassen. 40
7. Anordnung nach Anspruch 5 oder 6, **dadurch gekennzeichnet, dass** die Walzen (11, 12) in der Walzenpresse (4) eine Reihe axialer Rippen (13) aufweisen, die über den Umfang der Walzen gleichmäßig verteilt sind und sich über die gesamte Länge der Walzen erstrecken, wobei die Rippen (13) auf der einen Walze in die Abstände zwischen den Rippen (13) auf der zweiten Walze greifen, wenn sich die Walzen drehen. 45
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8. Anordnung nach Anspruch 5, 6 oder 7, **dadurch gekennzeichnet, dass** der Abreißer (5) eine drehbare Abreißerwalze umfasst. 55

9. Anordnung nach Anspruch 8, **dadurch gekennzeichnet, dass** die Anordnung Elemente umfasst, um die Walzenpresse (4) in Bezug auf die Abreißerwalze (5) radial zu bewegen.

10. Anordnung nach einem der Ansprüche 5-9, **dadurch gekennzeichnet, dass** das Element zum Erzeugen einer Luftströmung durch das Gehäuse von dem Lufteintritt zum Luftaustritt ein Gebläse (9) umfasst, dessen Austrittsseite mit dem Lufteintritt (7) des Gehäuses verbunden ist.

Revendications

1. Procédé pour produire un écoulement de fibres aéroportées, comprenant les étapes :

(a) une longueur continue (2) d'un faisceau de fils d'un matériau fibreux est alimenté à partir d'un stock (1) de matériau fibreux à travers une presse à rouleaux (4), qui tourne à une vitesse d'alimentation et avec le faisceau de fils maintenu fixement dans la ligne de contact entre ses rouleaux (11, 12), **caractérisé en ce que** la ligne de contact des rouleaux est entre les rouleaux (11, 12) de la presse à rouleaux (4) et par les étapes supplémentaires suivantes ;

(b) à la sortie de la presse à rouleaux (4), des fibres individuelles sont arrachées du faisceau de fils au moyen d'un arracheur (5),

(c) les fibres individuelles arrachées par l'arracheur sont éloignées de l'arracheur au moyen d'un écoulement d'air.

2. Procédé selon la revendication 1, **caractérisé en ce que** l'arracheur (5) comprend un arracheur rotatif et **en ce que** l'arracheur (5) tourne à une vitesse périphérique supérieure à 600 m/min, de préférence supérieure à 1200 m/min et davantage de préférence supérieure à 1500 m/min
3. Procédé selon la revendication 2, **caractérisé en ce que** la longueur des fibres aéroportées est ajustée par modification de la distance entre la presse à rouleaux (4) et l'arracheur (5).
4. Procédé selon la revendication 2 ou 3, **caractérisé en ce que** la quantité de fibres aéroportées est ajustée par modification de la vitesse de rotation de la presse à rouleaux (4)
5. Agencement pour la production de fibres aéroportées ayant une distribution de longueur définie à partir d'un faisceau de fils (2) d'un matériau fibreux, **caractérisé en ce que** l'agencement comprend un stock (1) de matériau fibreux sous la forme de longueurs continues (2) de faisceaux de fils, une presse

à rouleaux (4) comprenant des rouleaux (11, 12) avec un côté d'entrée pour des faisceaux de fils et un côté de sortie, un arracheur (5) agencé de manière adjacente au côté de sortie de la presse à rouleaux, un logement (6), qui renferme l'arracheur et qui comprend une ouverture sur le côté faisant face au côté de sortie de la presse à rouleaux, et des éléments (7, 8, 9) pour produire un écoulement d'air à travers le logement (6).

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6. Agencement selon la revendication 5, **caractérisé en ce que** les éléments pour produire un écoulement d'air à travers le logement (6) comprend une entrée d'air (7) et une sortie d'air (8) agencées aux côtés opposés du logement (6), et un élément (9) pour produire un écoulement d'air à travers le logement à partir de l'entrée d'air vers la sortie d'air.

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7. Agencement selon la revendication 5 ou 6, **caractérisé en ce que** les rouleaux (11, 12) dans la presse à rouleaux (4) possèdent une série de nervures axiales (13), également réparties le long de la circonférence des rouleaux et s'étendant sur la longueur totale des rouleaux, les nervures (13) sur le premier rouleau mettant en prise les intervalles entre les nervures (13) sur le deuxième rouleau quand le rouleau tourne.

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8. Agencement selon la revendication 5, 6, ou 7, **caractérisé en ce que** l'arracheur (5) comprend un rouleau d'arrachement rotatif

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9. Agencement selon la revendication 8, **caractérisé en ce que** l'agencement comprend des éléments pour déplacer la presse à rouleaux (4) radialement par rapport au rouleau de l'arracheur (5).

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10. Agencement selon l'une quelconque des revendications 5 à 9, **caractérisé en ce que** l'élément pour produire un écoulement d'air à travers le logement à partir de l'entrée d'air vers la sortie d'air comprend un souffleur (9), le côté de sortie duquel est relié à l'entrée d'air (7) du logement.

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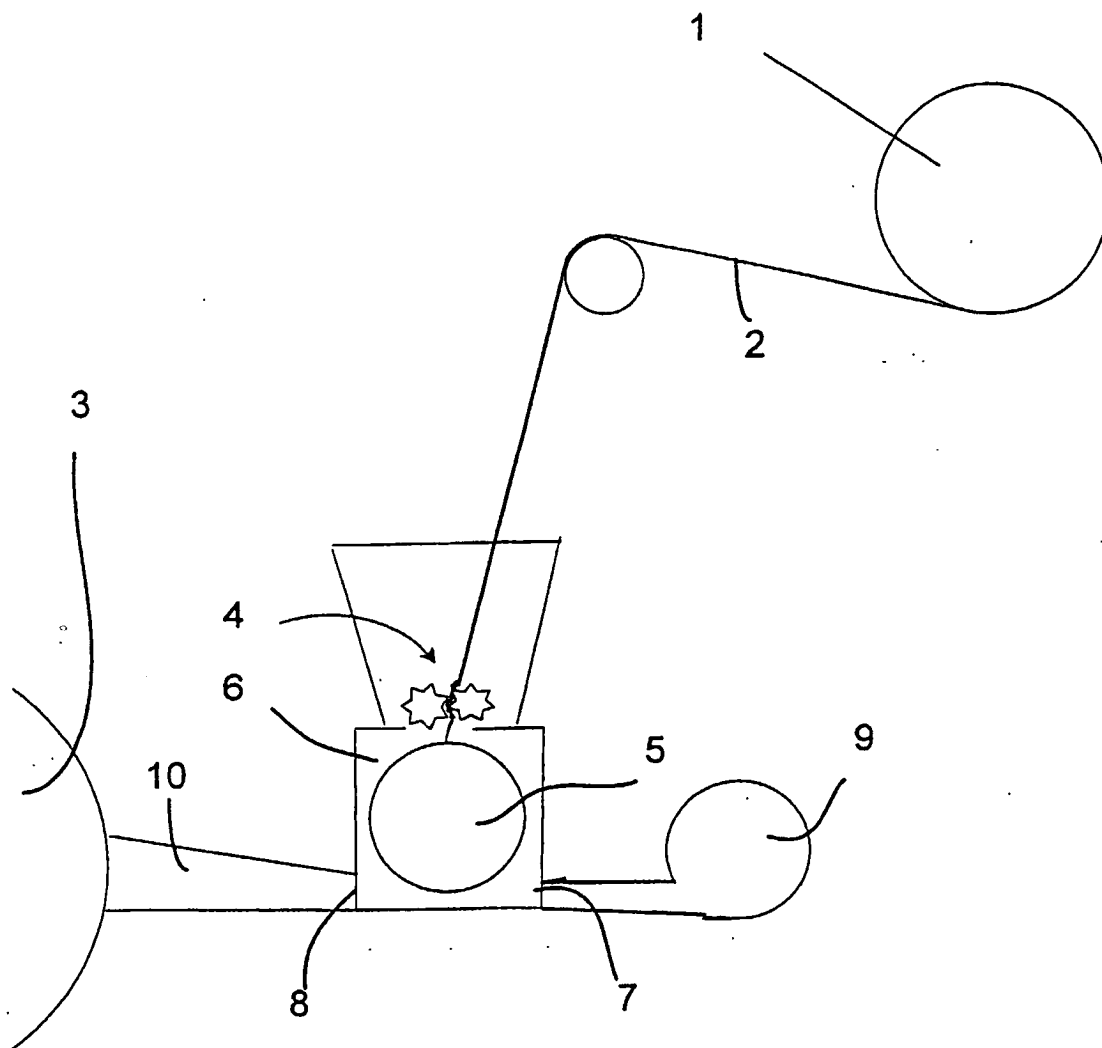


FIG. 1



FIG. 3

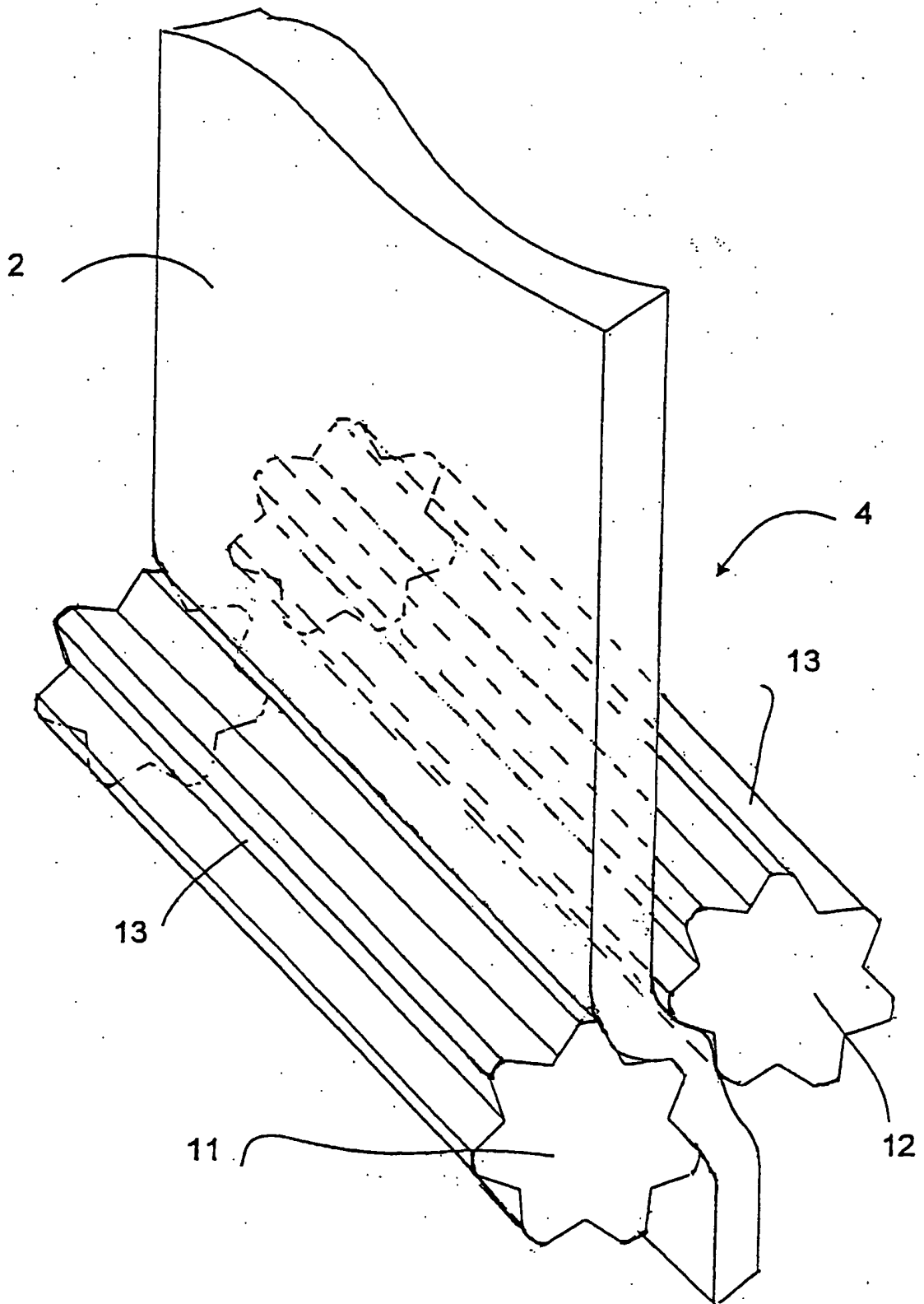


FIG. 2