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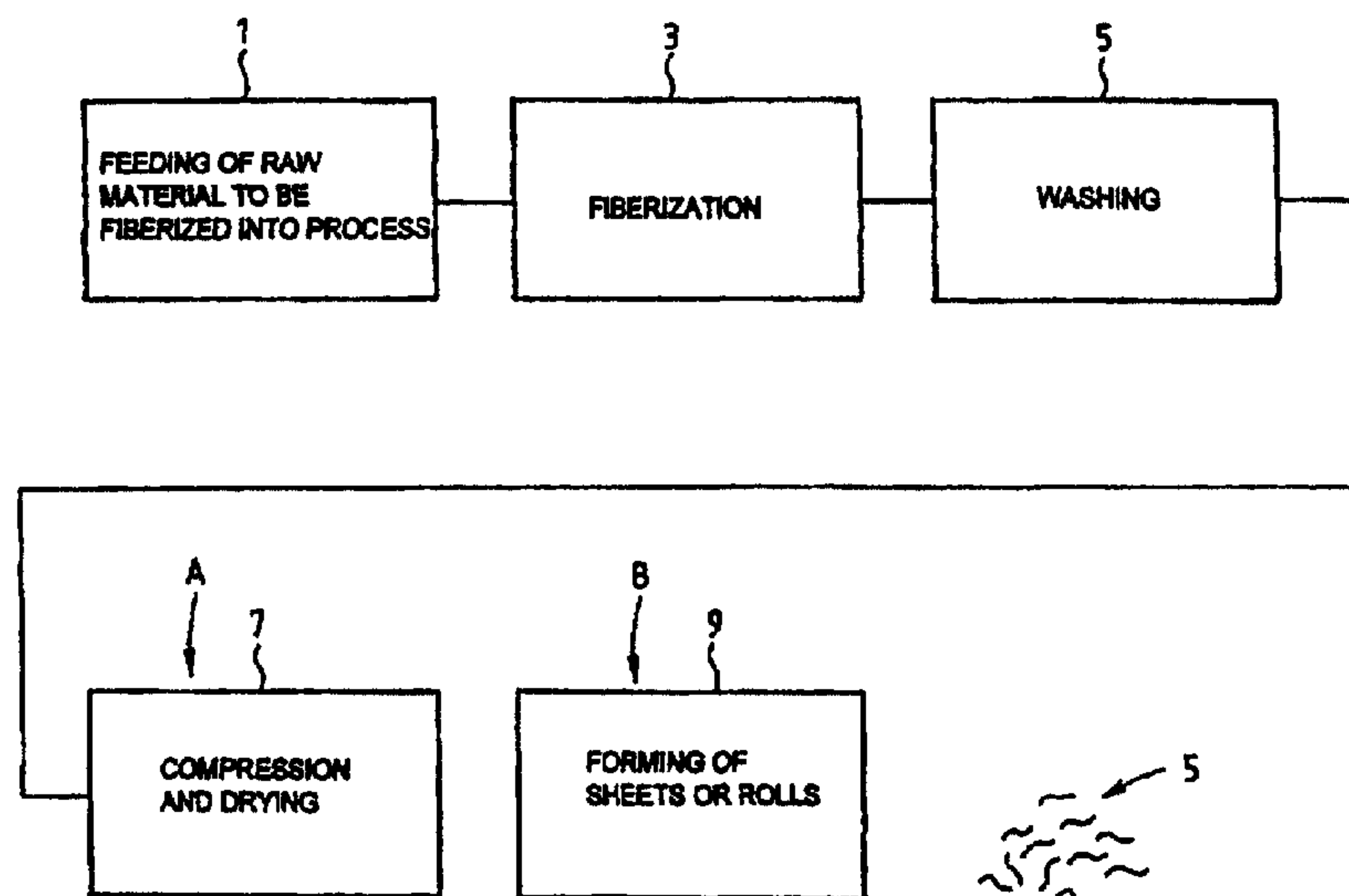
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(54) **PROCEDE DE PRODUCTION D'UN MATERIAU D'ISOLATION,
MATERIAU FIBREUX ORGANIQUE ET PROCEDE
D'ISOLATION PAR SOUFFLAGE POUR L'APPLICATION
D'UNE ISOLATION**

(54) **METHOD OF PRODUCING INSULATION MATERIAL,
ORGANIC FIBROUS MATERIAL, AND BLOW INSULATION
METHOD FOR PERFORMING INSULATION**



(57) L'invention concerne un procédé de production d'un matériau d'isolation, le procédé consistant à défibrer un matériau ligneux ou un autre matériau défibrable dans le processus de production de pâtes, à effectuer un lavage et un séchage, ledit matériau d'isolation étant refibré ultérieurement de manière à lui donner un plus gros volume. Le procédé est caractérisé en ce qu'on ajoute un adhésif au matériau d'isolation après l'étape de lavage mais avant le refibrage à exécuter ultérieurement, de manière à donner au matériau d'isolation un plus gros volume.

(57) A method of producing an insulation material, the method comprising fiberizing a wood material or another fiberizable material in the manufacturing process of pulp, performing washing and drying, said insulation material being refiberized later so as to provide it with a larger volume. The method is characterized in that an adhesive is added to the insulation material after the washing step but before the refiberization to be performed later so as to provide the insulation material with a larger volume.



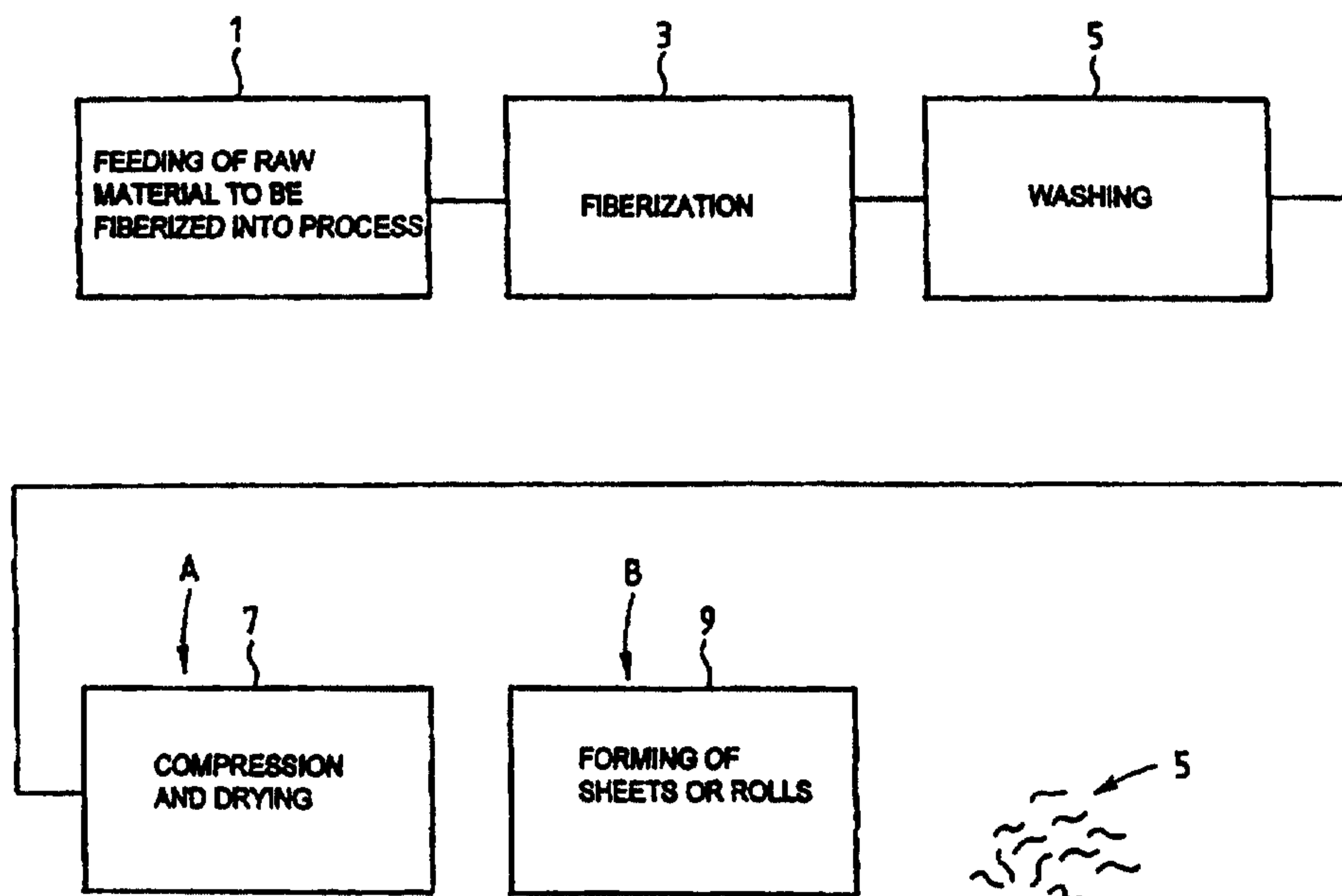
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<p>(21) International Application Number: PCT/FI98/00835 (22) International Filing Date: 27 October 1998 (27.10.98) (30) Priority Data: 974069 27 October 1997 (27.10.97) FI (71) Applicant (for all designated States except US): AISLO OY [FI/FI]; Mahlatie 1-3, FIN-94200 Kemi (FI). (72) Inventors; and (75) Inventors/Applicants (for US only): SMOLANDER, Raimo [FI/FI]; Piipontie 12, FIN-94500 Lautiosaari (FI). PUIKKO, Paavo [FI/FI]; Telkänkuja 12, FIN-94200 Kemi (FI). (74) Agent: PATENTTITOIMISTO TEKNOPOLIS KOLSTER OY; c/o Kolster OY AB, Iso Roobertinkatu 23, P.O. Box 148, FIN-00121 Helsinki (FI).</p>	<p>(81) Designated States: AL, AM, AT, AT (Utility model), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), EE, EE (Utility model), ES, FI, FI (Utility model), GB, GD, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model), SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</p> <p>Published With international search report.</p>	

(54) Title: METHOD OF PRODUCING INSULATION MATERIAL, ORGANIC FIBROUS MATERIAL, AND BLOW INSULATION METHOD FOR PERFORMING INSULATION



(57) Abstract

A method of producing an insulation material, the method comprising fiberizing a wood material or another fiberizable material in the manufacturing process of pulp, performing washing and drying, said insulation material being refiberized later so as to provide it with a larger volume. The method is characterized in that an adhesive is added to the insulation material after the washing step but before the refiberization to be performed later so as to provide the insulation material with a larger volume.

METHOD OF PRODUCING INSULATION MATERIAL, ORGANIC FIBROUS MATERIAL, AND BLOW INSULATION METHOD FOR PERFORMING INSULATION

BACKGROUND OF THE INVENTION

The invention relates to a method of producing an insulation
5 material, the method comprising fiberizing a wood material or another
fiberizable material in the manufacturing process of pulp, performing washing
and drying, said insulation material being refiberized later so as to provide it
with a larger volume.

The invention also relates to an organic fibrous material, which
10 contains fibrous material fiberized and washed in the manufacturing process of
pulp, the fibrous material being in the form of moist cellulosic pulp.

The invention further relates to an organic fibrous material, which
contains fibrous material fiberized and washed in the manufacturing process of
pulp, the fibrous material being compressed and dried into a solid sheet, band
15 or roll formed from the band.

Furthermore, the invention relates to a blow insulation method for
performing insulation, in which method the insulation material consists of a
cellulose-based fibrous insulation which is fiberized, washed and dried already
in the manufacturing process of pulp, the method comprising delivering the
20 insulation material in a solid form to the installation site, said solid insulation
material being refiberized at the installation site in the blowing step so as to
provide it with a larger volume.

The term "cellulosic pulp wool" is used either for wood fibre
insulations produced from clean wood fibre pulp, as in the present invention,
25 or for an insulation material produced from paper waste.

Insulations made of wood fibre pulp produced during the
manufacturing of pulp are described in FI 97743 and in FI 951624, which have
the same inventors as the present application. These insulations are known
under the name of VITAL insulation.

30 Generally speaking, an insulation may be shaped into a board or it
may be blown into the desired point in the form of blow wool. Blow wool can
be used for insulating base floors, intermediate floors and roofs of buildings.
The present invention relates particularly to a blow wool insulation, but also to
an organic fibrous material itself, which can be used for the desired purposes.
35 The invention may also be applied to the production of a planar insulation.

It is known to add salts, which improve the resistance of an insulation to various damaging agents, to an insulation material produced from paper waste after the crushing of the paper waste. Blow wool insulation methods and insulation products, in which the protecting agent and the adhesive are sprayed into the insulation material when the insulation comes out from a blowing apparatus, are also previously known. Solutions of this kind are problematic since the protecting agents and adhesives have to be mixed into the insulation material to be blown at the construction site, which may be difficult. Transportation of materials may also cause problems. Furthermore, since the conditions are seldom optimal at construction sites, safety at work may suffer and the work may become more difficult. In a prior art method of producing a planar insulation the adhesive is mixed in connection with refiberizing, which is not the ideal stage, because when the adhesive is moist, it is difficult to flatten the planar insulation product to a suitable thickness.

FI 912537 (priority US 663017) discloses a method and an insulation material in which a wood fibre insulation material produced by chemithermo-mechanical pulp method (CTMP) is delivered to the construction site in a compact form, e.g. in the form of a sheet or roll, which is fiberized into a fluffy form at the construction site. This method allows to save on transportation costs. The publication also teaches the addition of a protecting agent, as distinct from the normal manufacturing process of pulp, after the cellulosic pulp has been washed so that the protecting agent, such as a bactericide, fire retardant or anti-corrosive, is also added in the final stages of the process, e.g. at the wire or upon drying. In the normal manufacturing process of pulp the protecting agent is added before the washing stage, whereby the primary purpose of the protecting agent is to inhibit the growth of bacteria during the manufacturing process of pulp and not to improve the properties of the end product to be produced from pulp. However, the drawback related to the method and the insulation of this publication is that the adhesive is not added until in the final stages of the insulation method, i.e. at the stage at which the insulation material is refiberized into its fluffy form and when the insulation material is blown into the desired point at the construction site.

BRIEF DESCRIPTION OF THE INVENTION

The object of the invention is to provide a new solution which allows to avoid the problems and drawbacks related to the prior art solutions.

The above-mentioned object is achieved with a method of the invention, which is characterized in that an adhesive is added to an insulation material after the washing step but before the refiberization of the insulation material to be performed later so as to provide the insulation material with a larger volume.

A fibrous material of the invention is characterized in that the fibrous material also contains an adhesive, which is added to the fibrous material washed in the manufacturing process of pulp.

A fibrous material of the invention is further characterized in that the solid fibrous material also contains an adhesive, which is added to the fibrous material washed in the manufacturing process of pulp.

A blow insulation method of the invention is characterized in that the insulation material to be refiberized at the installation site is treated with an adhesive before the refiberization, but after the washing step of the production of the insulation material is carried out during the manufacturing process of pulp.

The invention is based on the idea that an adhesive is added to the material of which the insulation product is made. The adhesive may thus be added either to a washed pulp which is still in the manufacturing process of pulp, or to a more compact cellulosic sheet, roll containing cellulosic band, cellulosic web or to another fiberizable cellulosic product produced in the manufacturing process of pulp.

An advantage of the method and apparatus of the invention is that the insulation material is deep-impregnated with an adhesive, which provides the adhesive with a good resistance to wear and evaporation. The purpose of the adhesive is to stiffen the structure of the insulation product by adhering the cellulosic fibres of the insulation to other agents added to the insulation product, such as bonding fibres (e.g. viscose fibres). The adhesive also joins cellulosic fibres together. The method is also simple since for example in the blow wool application the adhesive no longer needs to be sprayed into the insulation product to be blown, which is the case in the prior art methods. Advantages are also achieved in the manufacturing process of insulating boards since the cellulosic sheets or cellulosic bands to be fed into the machine for manufacturing insulating boards are treated with an adhesive at an earlier stage. In the blow wool insulation application the invention can also be applied in such a manner that the refiberization is not performed until at the

installation site, whereby the insulation material is delivered to the installation site in a compact form, and not in the form of a fluffy insulation, the transportation of which would require several times more capacity.

BRIEF DESCRIPTION OF THE DRAWINGS

5 In the following the invention will be described in greater detail by means of preferred embodiments with reference to the accompanying drawings, in which

Figure 1a is a schematic representation of a method of producing an insulation material or another organic fibrous material,

10 Figure 1b illustrates fiberized and moist cellulosic pulp,

Figure 2 is a side view of a refiberization and blowing apparatus used in the blow wool application,

Figure 3 is a top view of a refiberization and blowing apparatus used in the blow wool application,

15 Figure 4 illustrates a blow wool insulation produced from wood fibre pulp,

Figure 5 illustrates an apparatus used for producing an insulating board in the insulating board application,

20 Figure 6 illustrates an insulating board produced from wood fibre pulp.

DETAILED DESCRIPTION OF THE INVENTION

Referring to Figures 1a and 1b the main steps of the production of an insulation material are set forth first. The process in question is a manufacturing process of pulp, where an insulation material or another organic
25 fibrous material to be used for other purposes is produced. In the first step in block 1 raw material, such as chips-like or sawdust-like wood material or another fibrous material is fed into the process. In the following step in block 3 fiberization is performed preferably by a chemical cooking method of pulp at a desired temperature, in desired moisture conditions and with desired
30 chemicals, the fiberization comprising separating lignin from the fibres by dissolution. This step is followed by washing in block 5. During the washing step unnecessary and harmful components are washed off from the pulp. In other words, chemical pulp is produced by the cooking method of pulp. It is possible to use for example the sulphate method or the sulphite method for
35 this purpose.

The next step comprises compression and drying which are performed in block 7. In block 9 the material is finally shaped e.g. into a sheet-like form or a band-like form, from which e.g. a roll may be formed.

For performing the above-mentioned blocks it is possible to use
5 devices and apparatuses which are known per se and used generally for these purposes in the field. It should be emphasized that the invention does not primarily relate to the details of the manufacturing process of pulp but to the addition of an adhesive to the cellulosic material to be used as an insulating material or as an organic fibrous material. As regards the details of the
10 manufacturing process of pulp reference is thus made to the prior art, e.g. to the publication *Selluloosa- ja paperiteknologia* (Cellulose and Paper Technology), by Markku Laatikainen, 1987, Lappeenranta University of Technology.

The invention primarily relates to a method of producing an
15 insulation material. The method comprises fiberizing wood material or another fiberizable material in the manufacturing process of pulp in block 3, washing it in block 5 and drying and compressing it into a solid form in block 7. In block 9 the dried insulation material is finally shaped into a sheet-like form or a band-like form, from which a roll is formed. Later the insulation material, or more
20 precisely compact insulation material having the form of a sheet or a band, for example, is refiberized either into a blow insulation according to Figure 4 with an apparatus according to Figures 2 to 3, or into an insulating board of Figure 6 with the apparatus according to Figure 5. In the refiberization the insulation product is provided with a larger volume, and thus it becomes fluffy. In the
25 refiberization a solid insulation material which is in a compact form is refiberized so as to provide a fluffy insulation product which has a larger volume and comprises separate fibres or fibre bundles. The refiberization may take place several days, weeks or even months after the manufacturing process of pulp, for example after the compact insulation material has been
30 delivered in the form of sheets or rolls from the pulp factory to the one who will perform blow insulation or to the producer of insulating boards.

An essential feature of the invention is that an adhesive is added to the insulation material after the washing step of block 5, but before the refiberization of the insulation material to be performed later so as to provide
35 the insulation material with a larger volume. Addition of the adhesive after the washing ensures that the adhesive content remains adequate. Addition of the

adhesive before the refiberization in turn simplifies the blowing of the insulation product into the desired point in the form of blow insulation wool, or alternatively simplifies the production of a planar insulation from the insulation product.

5 In Figure 1 the adhesive may be added in various steps. In a preferred embodiment of the invention the adhesive treatment is performed in the final steps of the actual manufacturing process of pulp after the washing step, i.e. after block 3, before the insulation material is provided with its final moisture content upon drying. An advantage of this is that the adhesive is
10 absorbed easily into a moist and warm material. Alternatively, in another preferred embodiment the adhesive treatment can be performed on the insulation material after the actual manufacturing process of pulp, the insulation material being compressed and in the form of a straight band, a roll formed from the band-like insulation material, a sheet or in another form, which
15 insulation material will be refiberized later on. In Figure 1 arrows A and B indicate the addition of the adhesive.

As was already stated, there are two alternative ways of carrying out refiberization. In a preferred embodiment refiberization takes place when a blow insulation is produced from the insulation material. In blow insulation it is
20 possible to use an apparatus of Figure 2, which comprises a blower 101 and a refiberizer 102. In Figure 2 the insulation material to be refiberized is in the form of rolls 103, 104 from which band-like insulation material is fed into the inlet opening 105 of the fiberizer 102. Reference numerals 106 and 107 indicate the engine of the blower and the engine of the refiberizer. The
25 insulation material rolls 102, 103 are arranged on rotation supports 109, 110 of a support 108 in the apparatus. In a preferred embodiment blow insulation is implemented in such a manner that the refiberization to be performed later on, before which the adhesive treatment is carried out, takes place after the actual manufacturing process of pulp, the insulation material being already
30 transferred to the installation site in a more compact form or at least to its immediate vicinity, whereby the refiberization takes place at the installation site or in its immediate vicinity when the installation material is blown into the desired point in the form of a blow insulation. The refiberization apparatus according to Figure 2 has thus been transferred to the installation site, i.e.
35 construction site, for example in a container or in a trailer and the insulation material has been transferred in the same way, for example, and specifically in

a solid form and not in a fluffy form packed into bags, as usual. In addition to the fact that less transportation capacity is needed this preferred embodiment has the advantage that the adhesive needs not be handled at the installation site because it has already been added to the insulation material for example
5 in the pulp factory during the manufacturing process of pulp or during the handling of cellulosic sheets or rolls.

When the invention is applied to the production of a planar insulation, refiberization takes place when insulating boards of Figure 6 are produced from the insulation material with the apparatus of Figure 5. In Figure
10 5 reference numeral 200 denotes a refiberizer, which may work on the same principles as the apparatus illustrated in Figures 2 and 3. In Figure 5 reference numeral 201 denotes a blower through which distributed, i.e. refiberized, cellulosic wool insulation, i.e. wood fibre insulation 202, is fed into a funnel 203. At the bottom of the funnel 203 there is a wire 204 which rotates between
15 rolls 205. Vertical slabs defining the width of the insulating boards are provided on the wire 204 in its longitudinal direction. A distributing conveyor 207 rotating at the speed of the wire conveyor 206 is located at the lower portion of the funnel 203 on rolls 208. Pushers 209 of the distributing conveyor 207 are abutted against the surface of the wire 204 in their lower position.

20 In the apparatus viscose gauze may also be used as the coating of insulating boards. A lower viscose gauze 211 is fed from a roll 212 onto the wire 204. Furthermore, vacuum suction may be used, in other words, a cellulosic insulation, or wood fibre insulation, or organic fibrous insulation 202 is sucked with blowers 213 and 214 into a smooth mat on top of the viscose
25 gauze 211. The low pressure produced by the blowers 213 and 214 is equalized with suction boxes 215 and 216 located below the wire 204. The arrows indicate the direction of flow. Flattening means such as a rotary brush 217 flattens the thickness of the insulation layer 218. An upper viscose gauze layer 219 may be fed onto the insulation layer 218 from the roll 220 with a wire
30 conveyor 221. A wire 222 presses the viscose gauze 219 onto the insulation layer 218. The wire 222 is located between rolls 223. Air is circulated with a blower 224 through the insulation layer 218. The arrows indicate the flows in a feed box 225 and suction box 226. A condenser unit 228 for separating water from the air flow and a heater unit 229 for heating the drying air are arranged
35 in a circulation conduit 227 in the flow direction. A continuous insulating board is cut into separate insulating boards having a given length. The completed

insulating board 230 is supplied to the rolls 231 for packaging. The insulating board 230 is shown in Figure 6. The insulating board 230 comprises two wide side planes 331 and 332 and four smaller end planes 333 to 336. The insulating board 230 comprises a base material 337 of cellulosic pulp wool, i.e. wood fibre pulp. The insulating board 230 may also comprise a bonding agent, i.e. bonding fibres 50, which may be for example bits of short or long viscose fibres. The insulating board also contains an adhesive. Reference numerals 339 and 341 indicate viscose meshes or other surface layers. In Figure 4 reference numerals 337 and 50 are used for wood fibres and bonding fibres.

10 According to the method of a preferred embodiment of the insulating board application, in the production of a planar insulation the adhesive in the insulating material is mainly in a crystal form or otherwise dry when the thickness of the insulation is being flattened after the refiberization, and an adhesive is added to the insulation material after the washing step but
15 before the refiberization to be performed later so as to provide the insulation material with a larger volume, and after the thickness of the insulation product has been flattened with the flattening means 217 in Figure 5, the insulation is moisturized in order to activate the adhesive. The moisturization can be carried out with block 240, which may be for example a steam generator 240.
20 The above-mentioned embodiment is advantageous because the flattening of the board thickness succeeds better if the adhesive is not moist when the surface of the insulating board to be produced is being flattened.

In the present invention the adhesive is used for joining bonding fibres added to the insulation material, such as viscose fibres, and other
25 bonding fibres with the wood fibres of the insulation. The adhesive also joins the wood fibres together. In the blow wool version illustrated in Figures 2 to 4 bonding fibres or another bonding agent may be added to the refiberized insulation material for example through the inlet opening 120 of the apparatus for spreading blow wool illustrated in Figure 2. In the apparatus for producing
30 insulating boards shown in Figures 5 to 6 it is possible to feed a bonding agent, such as viscose fibres which mix into the wood fibres of the insulation, for example into the refiberizer 200 or blower 201 in Figure 5. The adhesive that was added earlier is dry in this step, but it will be moisturized later on.

35 According to the method of a preferred embodiment of the invention the adhesive to be added to the insulation material is a cellulose-based adhesive, such as a cmc adhesive or another cellulose-based

adhesive. Such an adhesive is particularly suitable for use in a cellulose-based insulation material, which contains wood fibres.

According to the method of a preferred embodiment a protecting agent is also added to the insulation material, and the protecting agent is also
5 added after the washing step but before the refiberization. Thus the principle is the same as in the addition of an adhesive to the insulation material. More preferably, the adhesive and the protecting agent are added to the insulation material substantially simultaneously, which simplifies the method.

The protecting agent contains preferably boron and borax, or at
10 least one of the following substances: ammoniumpolyphosphate, aluminiumhydrate, aluminiumtrichloride, antimonioxide, aluminiumoxide. These chemical substances provide a good protection against fire, mould and bacterial growth.

The invention has also other applications than the production of
15 an insulation. Generally speaking, these applications relate to an organic fibrous material, which contains fibrous material that has been fiberized and washed in the manufacturing process of pulp and is in the form of moist cellulosic pulp. In that case the invention is characterized in that the fibrous material also contains an adhesive, which has been added to the fibrous
20 material washed in the manufacturing process of pulp. Thus the invention relates to a washed and moist cellulosic pulp, which contains an adhesive.

Alternatively, the invention may relate to an organic fibrous material, which contains fibrous material that has been fiberized and washed in the manufacturing process of pulp and is compressed and dried into a solid
25 form, such as a sheet, band or roll formed from the band. In that case the invention is characterized in that the fibrous material also contains an adhesive, which has been added to the fibrous material washed in the manufacturing process of pulp. Thus the invention relates to an organic fibrous material which contains an adhesive and is in the form of a sheet, band or a
30 roll formed from the band and may be used for refiberization or for other purposes.

The above-mentioned organic fibrous material treated with an adhesive may be used as the raw material of an insulation product or for other
purposes, such as the production of paper, paper board, wallpapers or other
35 special products.

In Figure 1b reference numeral 500 denotes fibres of the cellulosic pulp.

The invention can also be described by means of a blow insulation method for performing insulation. In the method the insulation material is a
5 cellulose-based fibrous insulation, which is already fiberized in the manufacturing process of pulp, washed and dried back into a solid form, the method comprising delivering the insulation material to the installation site in a solid form, the solid insulation material being refiberized at the installation site so as to provide it with a larger volume. According to the invention, the
10 insulation material to be used in the method and to be refiberized at the installation site is treated with an adhesive before the refiberization but after the washing step of the production of the insulation material is carried out during the manufacturing process of pulp.

It is obvious to a person skilled in the art that the basic idea of the
15 invention may be implemented in several different ways as the technology develops. The invention and its embodiments are thus not restricted to the examples described above, but may vary within the scope of the claims.

CLAIMS

1. A method of producing an insulation material, the method comprising fiberizing a wood material or another fiberizable material in the manufacturing process of pulp, performing washing and drying, said insulation
5 material being refiberized later so as to provide it with a larger volume, **characterized** in that an adhesive is added to the insulation material after the washing step but before the refiberization to be performed later so as to provide the insulation material with a larger volume.

2. A method according to claim 1, **characterized** in that the
10 adhesive treatment is performed in the final steps of the actual manufacturing process of pulp after the washing step before the insulation material is provided with its final moisture content upon drying.

3. A method according to claim 3, **characterized** in that the
15 adhesive treatment is performed after the actual manufacturing process of pulp on the insulation material which is compressed and in the form of a straight band, a roll formed from the band, a sheet or in another form, which insulation material is to be refiberized later on.

4. A method according to claim 1, 2 or 3, **characterized** in
20 that the refiberization is performed upon the production of a blow insulation from the insulation material.

5. A method according to claim 4, **characterized** in that the
refiberization to be performed later on, before which the adhesive treatment is carried out, takes place after the actual manufacturing process of pulp, the insulation material being already transferred to the installation site in a more
25 compact form or at least to its immediate vicinity, whereby the refiberization takes place at the installation site or in its immediate vicinity when the installation material is blown into the desired point in the form of a blow insulation.

6. A method according to claim 1, 2 or 3, **characterized** in
30 that the refiberization is performed upon the production of a planar insulation from the insulation material.

7. A method according to claim 6, **characterized** in that in
the production of a planar insulation the adhesive in the insulating material is
mainly in a crystal form or otherwise dry when the thickness of the insulation is
35 being flattened after the refiberization, and after the thickness of the insulation

product has been flattened, the insulation is moisturized in order to activate the adhesive.

8. A method according to claim 1, **characterized** in that the adhesive is used for joining the bonding fibres, such as viscose fibres or other
5 bonding fibres, added to the insulation material with the actual fibres of the insulation.

9. A method according to claim 1, **characterized** in that in the refiberization a solid and compact insulation material is fiberized into a fluffy insulation which comprises fibres or fibre bundles and has a larger
10 volume.

10. A method according to claim 1, **characterized** in that the adhesive to be added to the insulation material is a cellulose-based adhesive, such as a cmc adhesive or another cellulose-based adhesive.

11. A method according to claim 1, **characterized** in that a
15 protecting agent is also added to the insulation material, and the protecting agent is also added after the washing step but before the refiberization.

12. A method according to claim 1, **characterized** in that the adhesive and the protecting agent are added to the insulation material substantially simultaneously.

20 13. A method according to claim 1, **characterized** in that the protecting agent contains boron and borax.

14. A method according to claim 11, **characterized** in that the protecting agent contains at least one of the following substances: ammoniumpolyphosphate, aluminiumhydrate, aluminiumtrichloride,
25 antimonioxide, aluminiumoxide.

15. A method according to claim 1, **characterized** in that in the manufacturing process of pulp a cooking method of pulp by which chemical pulp is produced is used for fiberization.

30 16. An organic fibrous material, which contains fibrous material fiberized and washed in the manufacturing process of pulp and is in the form of moist cellulosic pulp.

17. An organic fibrous material, which contains fibrous material fiberized and washed in the manufacturing process of pulp and is compressed and dried into a solid sheet, band or roll formed from the band,
35 **characterized** in that the solid fibrous material also contains an

adhesive, which is added to the fibrous material washed in the manufacturing process of pulp.

18. An organic fibrous material according to claim 15 or 16, **characterized** in that the fibrous material is used as the raw material
5 of the insulation.

19. A blow insulation method for performing insulation, in which method the insulation material is a cellulose-based fibrous insulation, which is already fiberized in the manufacturing process of pulp, washed and dried back into a solid form, the method comprising delivering the insulation material to
10 the installation site in a solid form, the solid insulation material being refiberized at the installation site so as to provide it with a larger volume, **characterized** in that the insulation material to be refiberized at the installation site is treated with an adhesive before the refiberization but after the washing step of the production of the insulation material is carried out
15 during the manufacturing process of pulp.

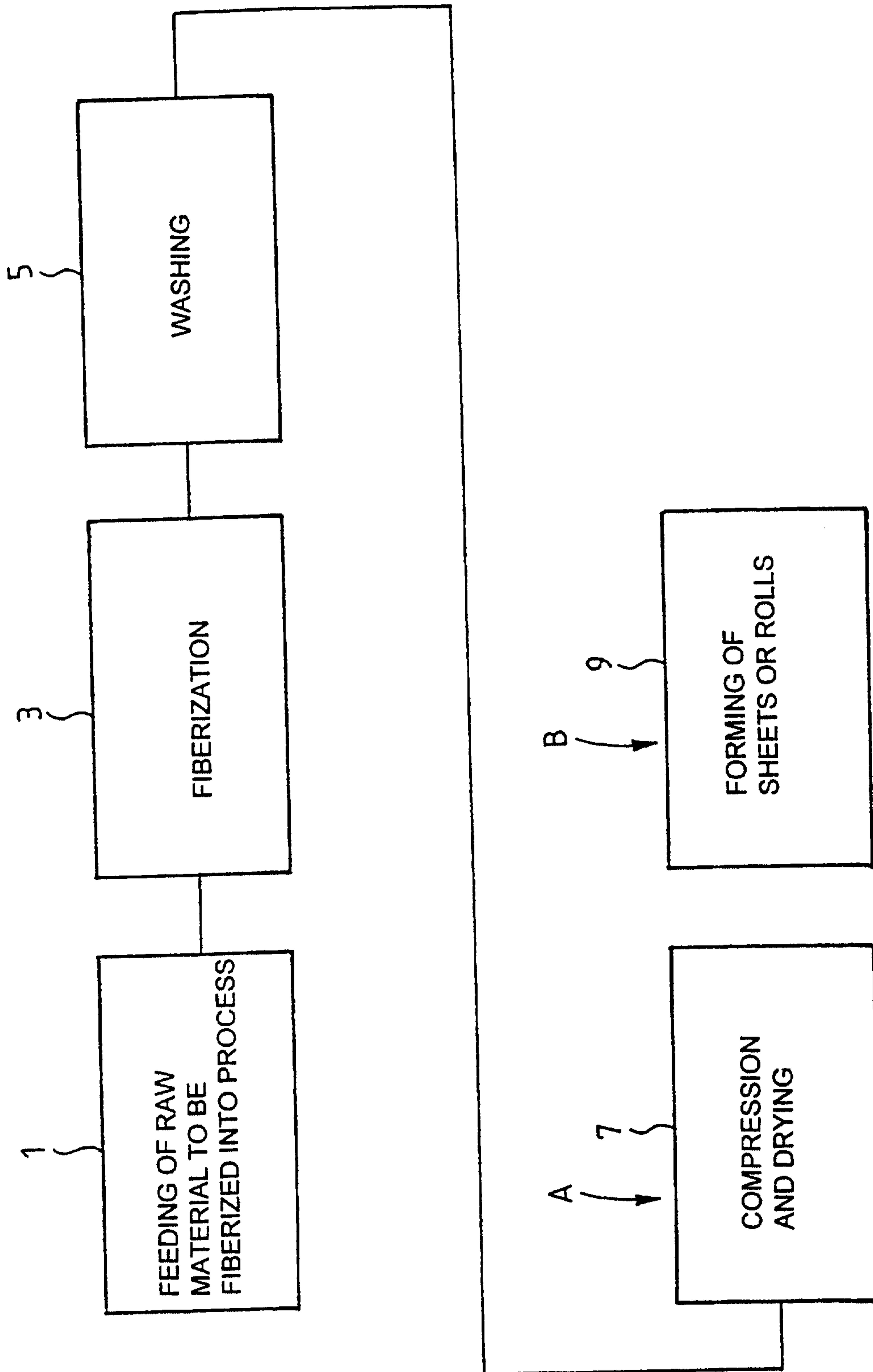


FIG. 1a

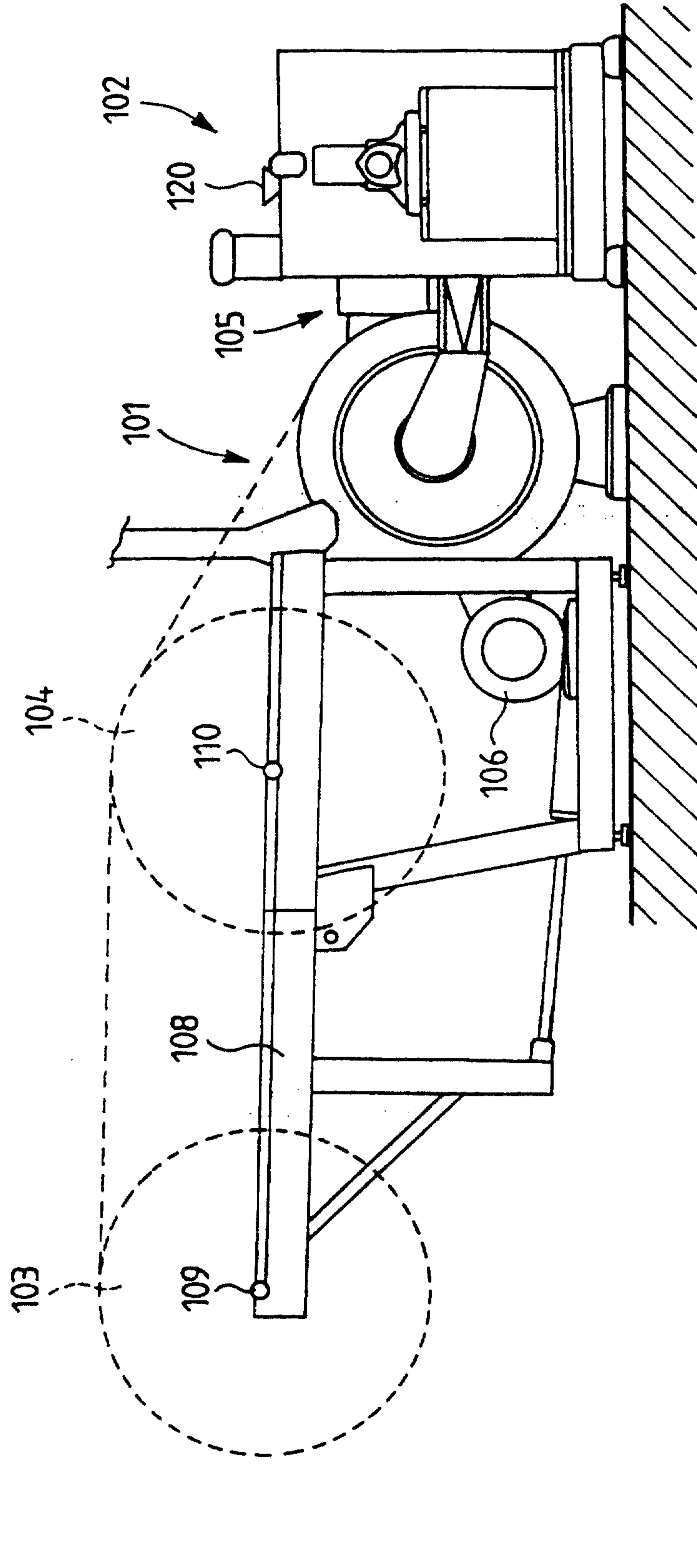


FIG. 2

FIG. 1b

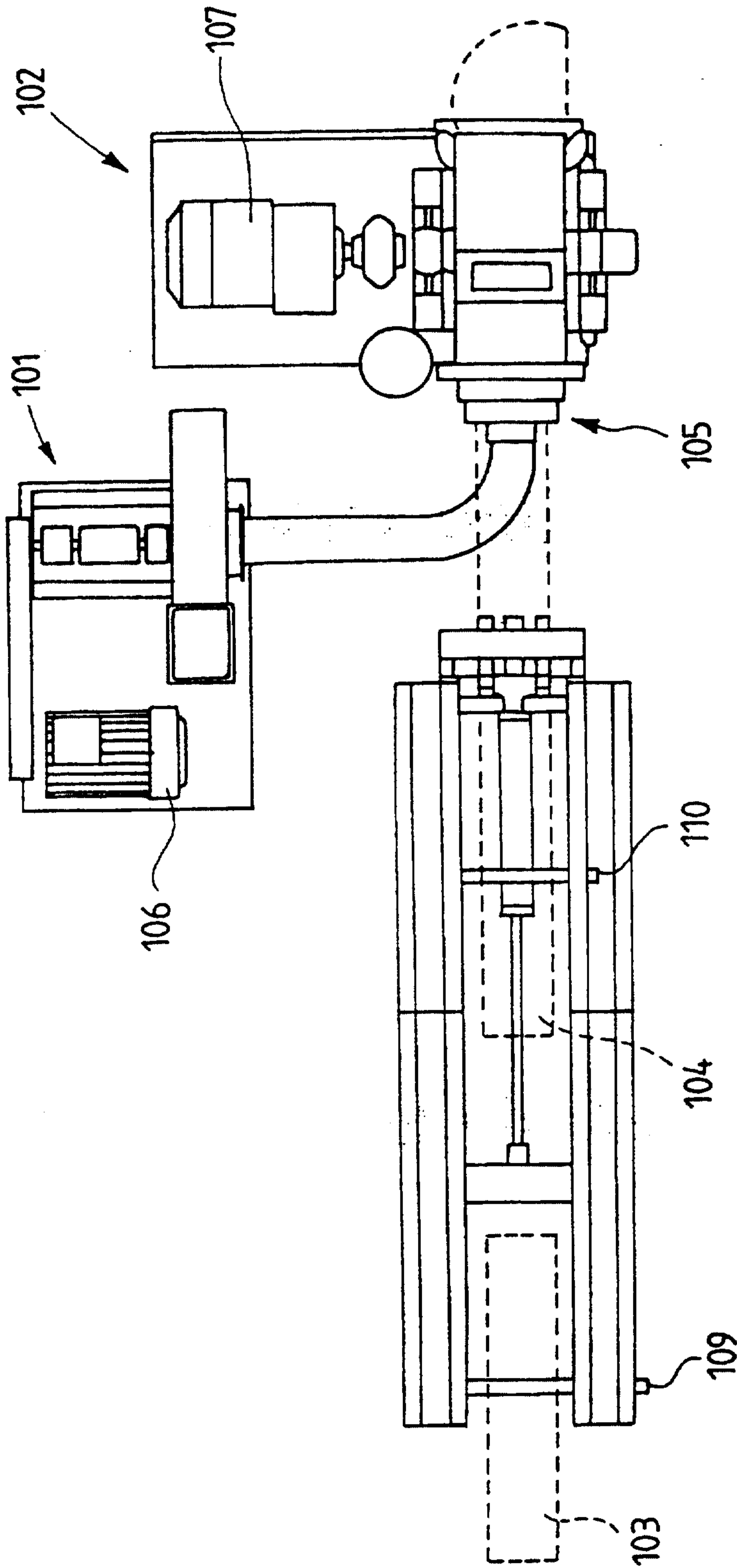


FIG. 3

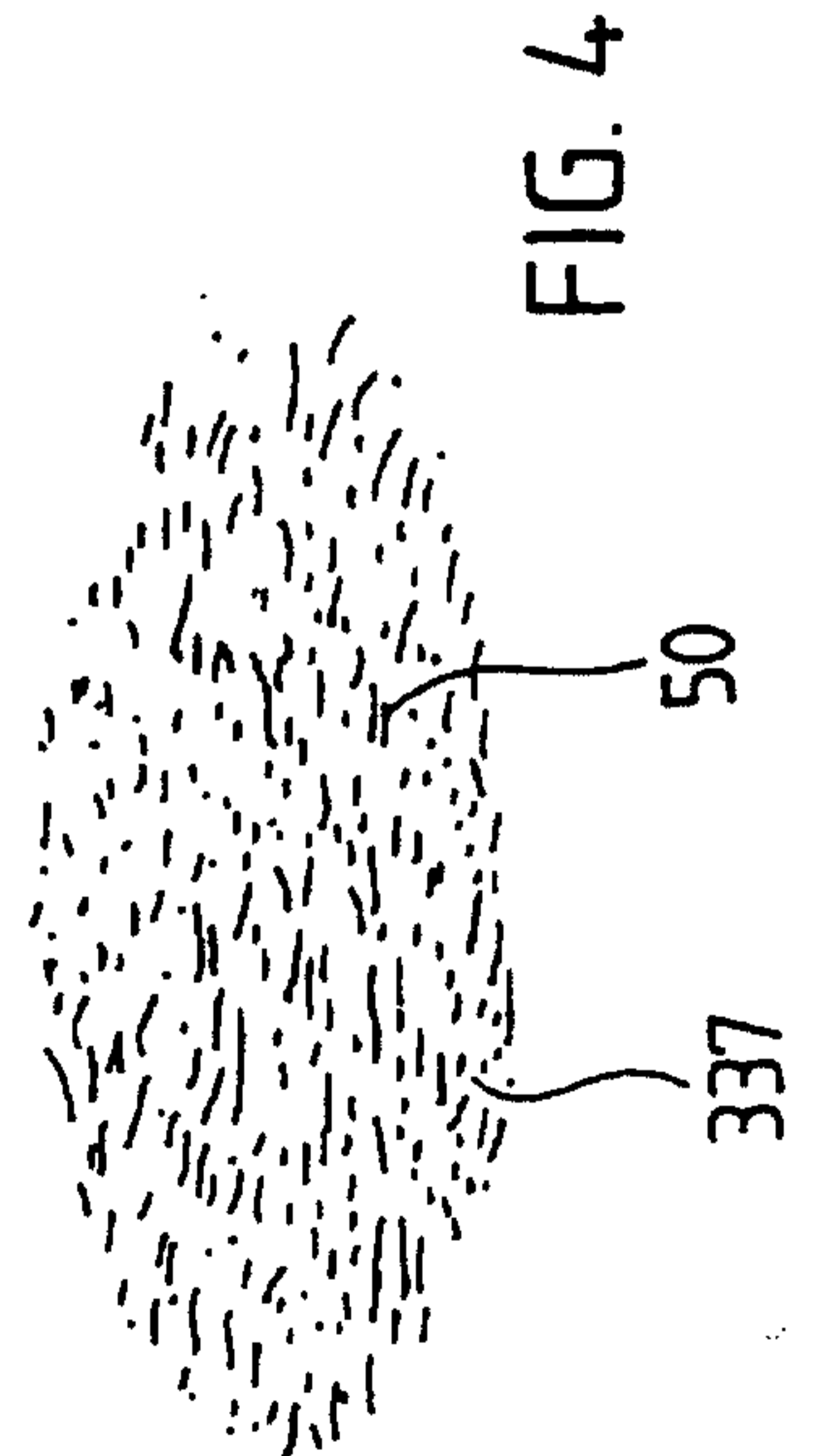


FIG. 4

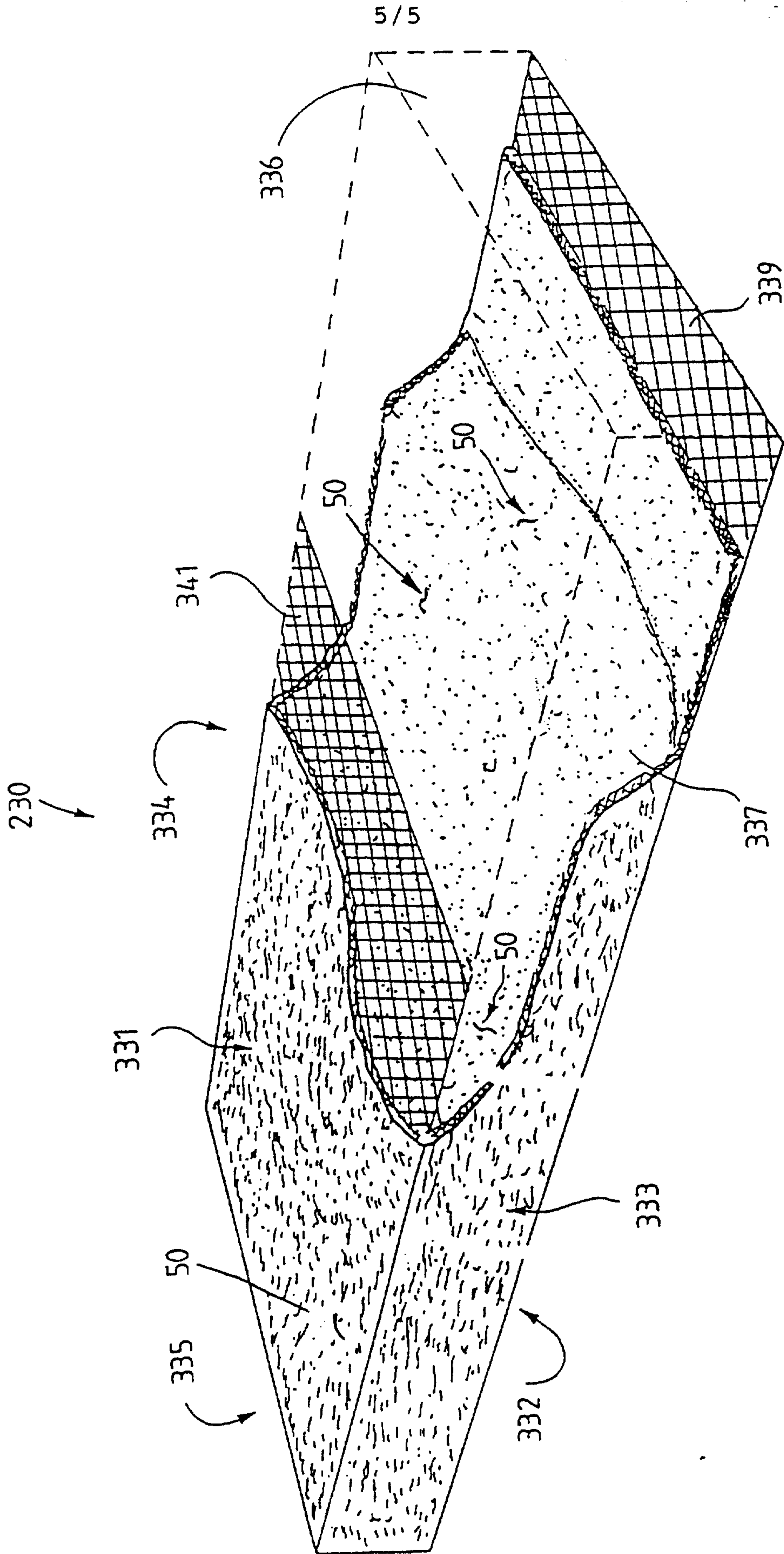


FIG. 6