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(54) **Method for producing loose material for making a field for sports activities and loose material so obtained**

(57) A method for making a field for sports activities comprises the step of feeding raw material based on coconut to milling means (11). Here the material (10) is milled and, on the one hand, a certain amount of longer fibres are obtained that are withdrawn, and on the other hand, a certain amount of short and medium fibres are obtained, hereafter indicated generically as raw material based on ground coconut (15). The raw material based

on ground coconut (15), having a heterogeneous granulometry, is loaded by a hopper (12) on a conveyor belt (20) for being fed in a sieve. In the sieve (32) the separation is obtained of the powder part (16) from the granular and fibrous parts (17). The latter are sent by a conveyor belt (22) to a storage reservoir (43) and from there sent towards processes for making loose material to provide substrates for sports activities.

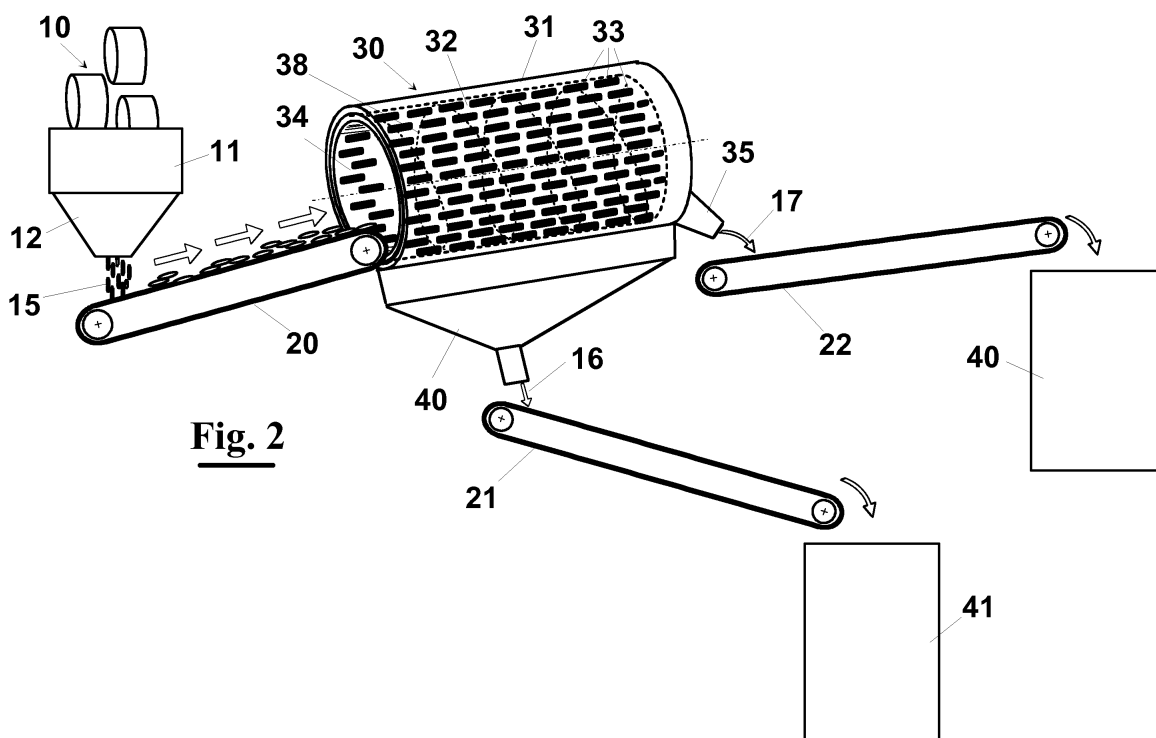


Fig. 2

Description

Field of the invention.

[0001] The present invention relates to a method for making a field of loose material for sports activities, such as a racing ground for motocross, rally, etc., a racing ground for equestrian sports, both for outdoor and indoor activities.

[0002] Furthermore, the invention relates to a loose material obtained with this method.

Description of the prior art.

[0003] As well known, sports surfaces, in particular racing grounds and training fields for equestrian sports, motocross and rally, can be of various types, for example of turf, of sand, and can provide the use of material such as sawdust, etc., according to the desired features.

[0004] However, with time and owing to unfavourable weather, the known grounds can have some drawbacks.

[0005] In particular, the known grounds for outdoor activities must have high capacity of absorption and drainage of water, to allow the use also in case of rain, or not much time after rainfall.

[0006] The use of sand to make grounds for sports activities has various drawbacks, among which high cost and the possibility of causing excoriations and abrasions on the skin of the users, for example in case of fall. In particular, some types of sand are characterized by thickening with time, and then are instable. Other types of sand, instead, have an high water retention and are then too soft in operative conditions.

[0007] In order to solve the above described drawbacks of the surfaces that are made of turf, sand or similar material, in US 4900010 the feature is described to provide sports surfaces using pulverized or granulated bark or wood. It is also possible to use a measured amount of coconut fibres.

[0008] The use of coconut fibres is provided also in DE20309789U1 mixed with a determined amount of sand, obtaining a surface that can be used in training fields and in racing grounds for equestrian sports.

[0009] However, it should be noted that coconut material comprises loose and powder parts. The latter are in large ratio and have size less than 500 micron. They have the drawback of requiring to be maintained humid because, in the presence of wind, or under intense sports activities, for example horse-riding and motocross, they cause powder raising and discomfort for the users. To overcome this drawback it is necessary to wet it frequently.

[0010] On the other hand, the dust deriving from grinding coconuts have a high capacity of water retention and, in case of abundant rain, it emphasizes the presence of water stagnation. In particular, the fine parts of the coconut fibres percolate with rainwater and block water drainage. In addition, rainwater can cause with time the fine

parts to compact and worsen further the drainage of the ground as well as the technical performances of the sports field.

5 Summary of the invention

[0011] It is therefore a feature of the present invention to provide a method for making a field of loose material for sports activities, in particular to provide surfaces to be used as racing ground and training fields, such as for equestrian sports and motocross, which avoids the drawbacks of the materials commonly used to provide sports surfaces.

10 **[0012]** It is also a feature of the present invention to provide a method for making a field of loose material for sports activities to avoid raising dust from the ground during the use.

[0013] It is another feature of the present invention to provide a method for making a field of loose material that provides a surface at high resistance against soil compaction.

20 **[0014]** It is a particular feature of the present invention to provide a method for making a field of loose material that allows obtaining a surface capable of keeping the humidity in order to avoid frequent watering in conditions of dry weather.

25 **[0015]** It is a particular feature of the present invention to provide a method for making a field of loose material that allows obtaining a surface that is not easily subject to bacterial attack and then it is not subject to quick degradation.

30 **[0016]** It is, furthermore, a feature of the present invention to provide a loose material for sports activities that presents the same advantages.

35 **[0017]** These and other features are accomplished with one exemplary loose material, according to the invention, for sports activities comprising a measured amount of a product based on coconut, whose main feature is that said product based on coconut comprises the sole granular and fibrous parts contained in a raw material based on ground coconut.

40 **[0018]** In particular, the granular and fibrous parts of the raw material based on coconut are obtained by submitting the raw material to a separation step of the granular and fibrous parts from the powder parts.

45 **[0019]** Advantageously, the above described separation of the granular and fibrous parts from the powder part of the raw material based on ground coconut is made by milling the raw material in a grinding means, obtaining said product that comprises the granular and fibrous parts and a powder part.

[0020] In particular, the loose material can comprise, furthermore, a measured amount of sand.

50 **[0021]** Advantageously, the loose material has a content of the granular and fibrous parts of the raw material based on coconut set between 40% and 80% in volume, and a content of sand set between 20% and 60% in volume.

[0022] Preferably, the loose material has a content of the granular and fibrous parts of the raw material based on coconut set between 50% and 70% in volume, and a content of sand set between 30% and 50% in volume.

[0023] In particular, the sand is selected sand, preferably ventilated sand, with controlled granulometry, in particular set between 0,4 and 2,5 mm.

[0024] Advantageously, the granular and fibrous parts based on coconut have the following granulometry:

- between 20% and 40% by weight sized between 0.8 mm and 1.25 mm;
- between 15% and 35% by weight sized between 1.25 mm and 1.60 mm;
- between 50% and 70% by weight larger than 1.6 mm.

[0025] According to another aspect of the invention, a method to obtain a product based on coconut that can be used as loose material to provide surfaces for sports activities provides the steps of:

- feeding to a separating means a raw material based on ground coconut comprising a granular and fibrous part and a powder part,
- separating by said separating means the granular and fibrous parts from the powder part of the loose material;
- mixing the granular and fibrous parts with selected sand.

[0026] Advantageously, said raw material based on ground coconut is obtained by milling the raw material based on coconut in a grinding means, obtaining said product that comprises a granular and fibrous part and a powder part.

[0027] Preferably, the separating means comprises sieving means selected from the group comprised of:

- a mechanical sieve, in particular a rotating sieve,
- an electromagnetic sieve.

[0028] According to a further aspect of the invention, a method for making a field for sports activities provides a step of distributing a loose material comprising a measured amount of a product based on coconut on a surface to cover, whose main feature is that said product based on coconut comprises the sole granular and fibrous parts contained in a raw material based on ground coconut.

Brief description of the drawings

[0029] The invention will be now shown with the following description of an exemplary embodiment thereof, exemplifying but not limitative, with reference to the attached drawings wherein:

- figure 1 diagrammatically shows a perspective view of a partial cross sectional view of a coconut shell

that can be used as starting material in the method for making a field of loose material for sports activities, according to the invention;

- figure 2 diagrammatically shows a plant that achieves a preliminary step of the method according to the invention, for making a field of loose material for sports activities.

Description of a preferred exemplary embodiment

[0030] With reference to Fig. 1, a coconut 100 comprises, in summary, an epicarp 101, thin, smooth and in grey-brownish colour, a fibrous mesocarp 102, often 4-8 cm, and a wooden endocarp 103. The latter represents the coconut fruit whose pulp is used as food. The epicarp 101 and the fibrous mesocarp 102, hereafter generically indicated as material based on coconut 10, which may comprise also coconut tree material comprising branches and leaves of coconut trees, is sent to a plant for making loose material to provide a field for sports activities, according to the invention.

[0031] In particular, the method for making a field for sports activities, according to the invention, can be carried by the plant shown in Fig. 2. In use, raw material based on coconut, for example transported as a bale 10, is sent to milling means such as a hammer mill 11. By milling the material 10, on the one hand, long fibres are obtained that are separated from the remaining material and used, for example for making ropes and mats, and on the other hand short and medium fibres and powder are obtained, hereafter indicated generically as raw material based on ground coconut 15.

[0032] Alternatively, the raw material based on ground coconut is already separated from the long fibres in the places of production, and then put into compressed bales for transportation.

[0033] The raw material based on ground coconut 15, having a heterogeneous granulometry that spans between a few microns to several mm, and with a relevant powdery part less than 500 micron, is loaded by a hopper 12 on a conveyor belt 20 for being fed to a sieve. The latter can be for example a rotating sieve 30 comprising an external jacket 31 in which a cylindrical screen 32 is arranged.

[0034] In operative conditions, the cylindrical screen 32 is subject to a controlled vibration to assist the movement of the powder part 16 of the ground loose product 15 through the screen. The screen has apertures with a size corresponding to the desired sieving size.

[0035] In sieve 32 a screw conveyor can be mounted, diagrammatically shown in Fig. 1 with dotted line 38, which is adapted, on the one hand, to convey the whole mass causing the powder part 16 to pass through sieve 32, and, on the other hand, to push the granular and fibrous parts 17 towards an outlet 35 of the rotating sieve, which is located opposite to inlet 34. The powder part 16 of the loose material, once reached sieve 32, hits against the inner wall of jacket 31 and falls by gravity on a con-

veyor belt 40 arranged below sieve 32. From conveyor belt 40, the powder part 16 is brought, by a further conveyor belt 21, to a storage reservoir 41 for being then used in cultivation for being used as such, or mixed to peat, to provide substrates of culture.

[0036] The granular and fibrous parts 17 of the loose material, which represents the main product of the process, is, instead, sent by a conveyor belt 22 to a storage reservoir 43 and from there sent to processes for making loose material, adapted for sports activities, according to the methodology described hereafter.

[0037] After the sieving step, the granular and fibrous parts can have the following granulometry:

- between 20% and 40% by weight sized between 0.8 mm and 1.25 mm;
- between 15% and 35% by weight sized between 1.25 mm and 1.60 mm;
- between 50% and 70% by weight larger than 1.6 mm.

[0038] In particular, the loose material to provide substrates for sports activities, in addition to the loose product that has the sole granular and fibrous parts contained in the raw material based on ground coconut, it can comprise also sand, in particular, selected sand, ventilated sand with controlled granulometry set between 0,4 and 1,25 mm.

[0039] The final loose material may have a content of the granular and fibrous parts of the ground loose product based on coconut set between 40% and 80% in volume, and a content of sand set between 20% and 60%.

[0040] Advantageously, the final loose material has a content of the granular and fibrous parts of the ground loose product based on coconut set between 50% and 70% in volume, and a content of sand set between 30 and the 50%.

[0041] The loose material thus obtained has as main advantage, which is obtained by using the sole granular and fibrous parts 17 of the loose product based on coconut, to avoid raising powder from the field for sports activities during its use and to avoid, furthermore, that the dust can compact in the presence of water.

[0042] The following are examples of some possible compositions of a field of loose material for sports activities, according to the present invention.

EXAMPLE 1

[0043] The loose material has the following composition:

- content of granular and fibrous parts of the raw material based on coconut about 60% in volume,
- content of sand is about 40% in volume.

[0044] In particular, this composition can be advantageously used to provide a field for equestrian sports. The above described composition in particular has a humidity

about 30-35%.

EXAMPLE 2

[0045] The loose material has the following composition:

- content of granular and fibrous parts of the raw material based on coconut is about 70% in volume,
- content of sand is about 30% in volume.

[0046] In particular, this composition can be advantageously used to provide racing ground for motocross, rally and similar activities. The above described composition has in particular a humidity 30-35%.

[0047] The foregoing description of a specific embodiment will so fully reveal the invention according to the conceptual point of view, so that others, by applying current knowledge, will be able to modify and/or adapt for various applications such an embodiment without further research and without parting from the invention, and it is therefore to be understood that such adaptations and modifications will have to be considered as equivalent to the specific embodiment. The means and the materials to realise the different functions described herein could have a different nature without, for this reason, departing from the field of the invention. It is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

Claims

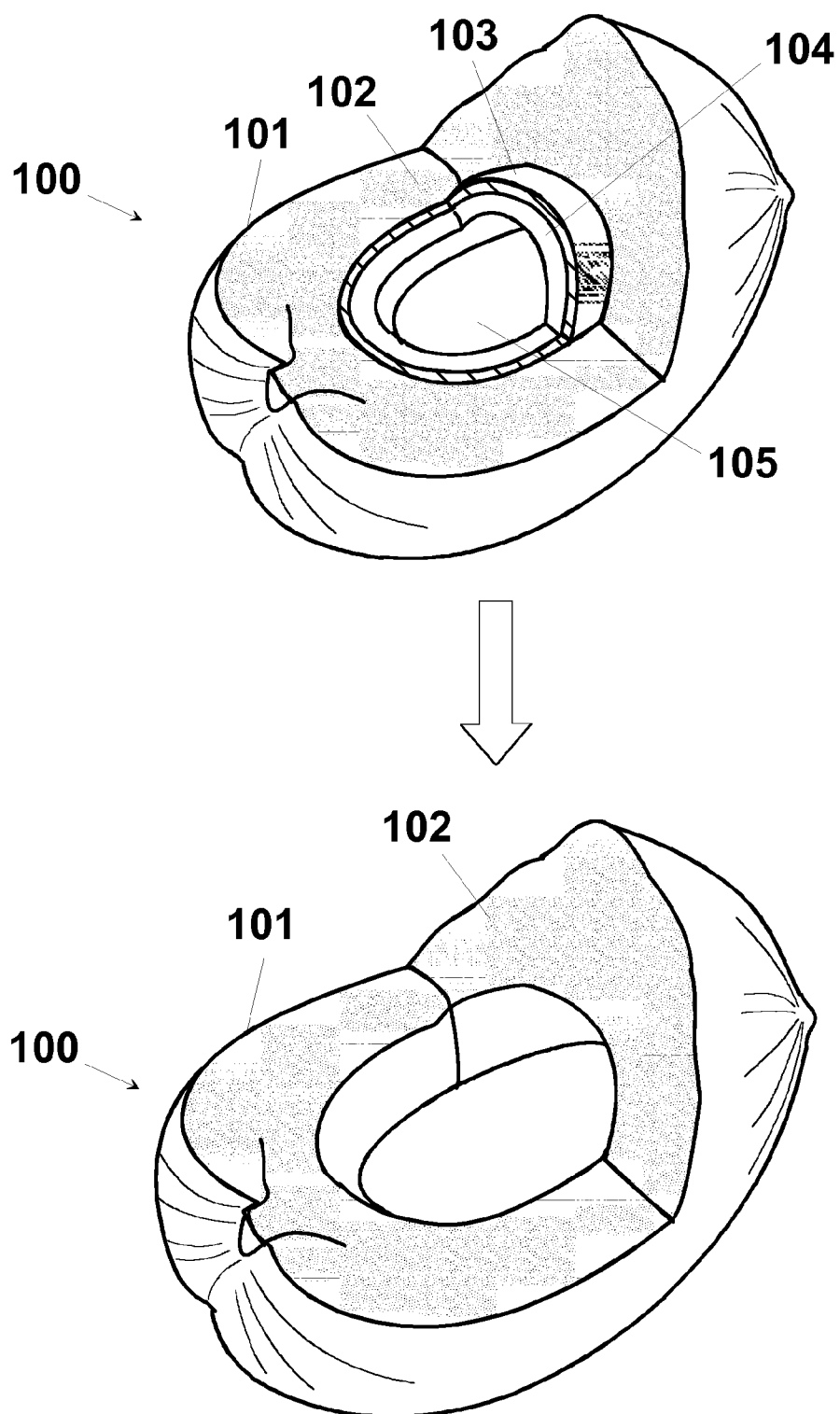
1. Loose material to provide surfaces for sports activities, in particular training fields and racing grounds for equestrian sports and motocross, said loose material comprising a measured amount of a product based on coconut, **characterised in that** said product based on coconut comprises the sole granular and fibrous parts contained in a raw material based on ground coconut.
2. Loose material, according to claim 1, wherein said granular and fibrous parts of said raw material based on coconut is obtained by submitting said raw material to a step of separating said granular and fibrous parts from said powder part.
3. Loose material, according to claim 1, wherein said step of separating said granular and fibrous parts from said powder part of said raw material based on ground coconut is made by milling said raw material in a grinding means, obtaining said product that comprises the granular and fibrous parts and a powder part.
4. Loose material, according to claim 1, wherein said loose material comprises, furthermore, a measured

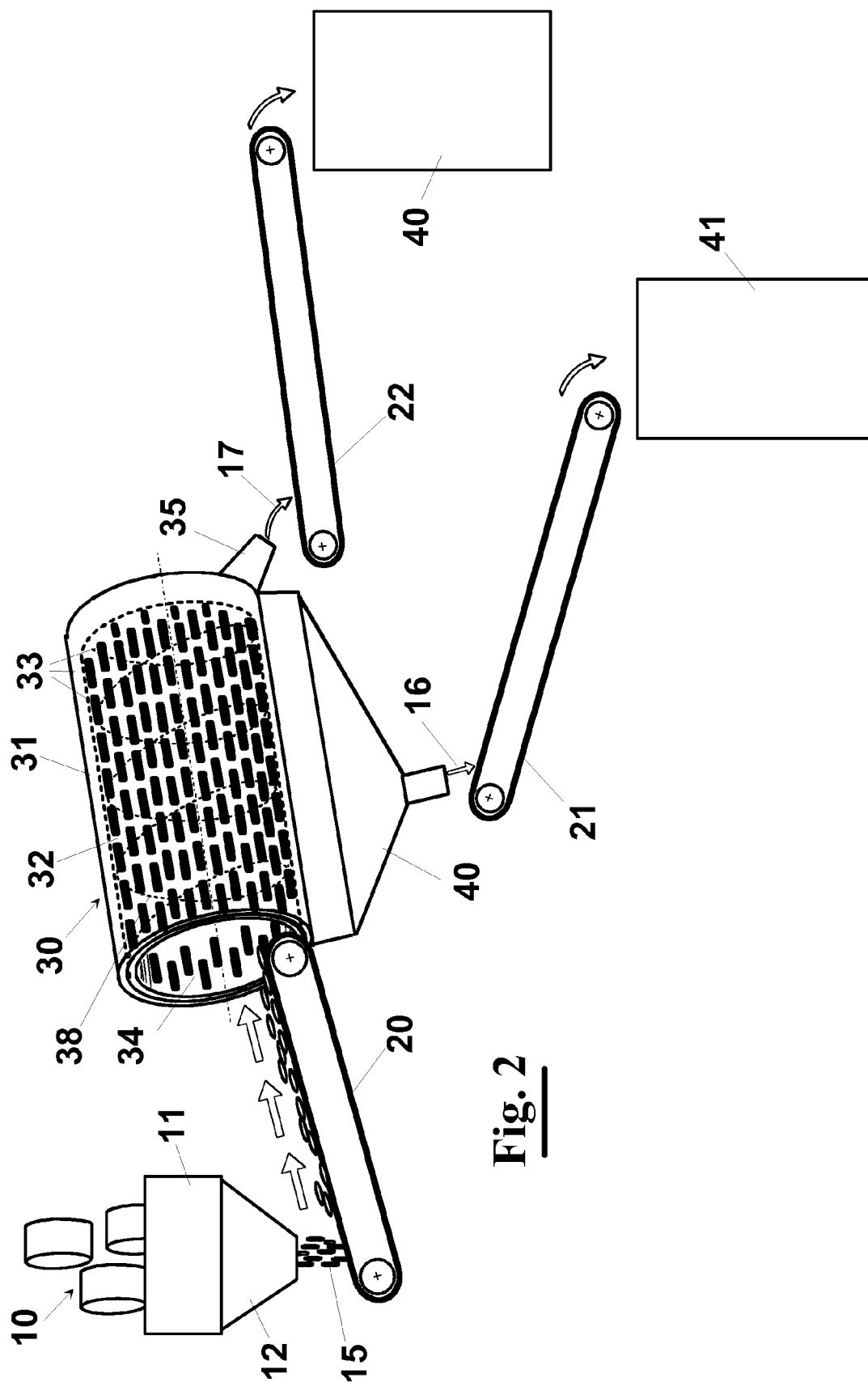
amount of sand.

5. Loose material, according to claim 1, wherein said loose material has a content of the granular and fibrous parts of the raw material based on coconut set between 40% and 80% in volume, and a content of sand set between 20% and 60% in volume. 5
6. Loose material, according to claim 1, wherein said loose material has a content of the granular and fibrous parts of the raw material based on coconut set between 50% and 70% in volume, and a content of sand set between 30% and 50% in volume. 10
7. Loose material, according to claim 4, wherein said sand is selected sand, preferably ventilated sand with controlled granulometry, in particular set between 0,4 and 2,5 mm. 15
8. Loose material, according to claim 1, wherein said granular and fibrous parts of said material based on coconut has the following granulometry: 20
 - between 20% and 40% by weight sized between 0.8 mm and 1.25 mm; 25
 - between 15% and 35% by weight sized between 1.25 mm and 1.60 mm;
 - between 50% and 70% by weight larger than 1.6 mm. 30
9. Method to obtain a product based on coconut that can be used as loose material to provide surfaces for sports activities, **characterised in that it provides** the steps of: 35
 - feeding to a separating means a raw material based on ground coconut comprising a granular and fibrous part and a powder part ;
 - separating by said separating means the granular and fibrous parts from the powder part of the loose material; 40
 - mixing the granular and fibrous parts with selected sand.
10. Method, according to claim 9, wherein said raw material based on ground coconut is obtained by milling said raw material based on coconut in a grinding means, obtaining said product that comprises a granular and fibrous part and a powder part. 45 50
11. Method, according to claim 9, wherein said separating means comprises sieving means selected from the group comprised of:
 - a mechanical sieve, in particular a rotating sieve, 55
 - an electromagnetic sieve.

12. Method for making a field for sports activities through laying a loose material comprising a measured amount of a product based on coconut on a surface to cover **characterised in that** said product based on coconut comprises the sole granular and fibrous parts contained in a raw material based on ground coconut.

Fig. 1







EUROPEAN SEARCH REPORT

Application Number
EP 08 16 7692

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 23 February 2009	Examiner Kerouach, May
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			

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EPO FORM 1503 03.82 (P04C01)

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

EP 08 16 7692

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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