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TO: THE COMMISS
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CONVENTION APPLICATION FOR A STANDARD PATENT

We Inter-Wood-Maschinen GmbH & Co. KG of Am Bahnhof 5, 8923 Lechbruck Am See, Federal Republic of Germany hereby apply for the grant of a standard patent for an invention entitled:

"METHOD OF PRODUCING PARTICULATE MATERIAL, ESPECIALLY FLAKES,
AND DEVICE FOR PERFORMING THE METHOD"

which is described in the accompanying complete specification.

DETAILS OF BASIC APPLICATION

Number of Basic Application: - P 33 09 517.5

Name of Convention Country in which Basic Application was filed: - Federal Republic of Germany

Date of Basic application: - 17 March 1983

Our address for service is: -

C/- Spruson & Ferguson
Patent Attorneys
Level 33 St Martin's Tower
31 Market Street
Sydney New South Wales Australia

DATED this SIXTEENTH day of MARCH 1984

Inter-Wood-Maschinen GmbH & Co. KG

By:


TO: THE COMMISSIONER OF PATENTS
AUSTRALIA
JP/JR/0010F
DECLARATION IN SUPPORT OF A CONVENTION APPLICATION FOR A PATENT

In support of the Convention application made for a patent for an invention entitled:

"METHOD OF PRODUCING PARTICULATE MATERIAL, ESPECIALLY FLAKES, AND DEVICE FOR PERFORMING THE METHOD"

Made by Karl Schäfer and Heinz Stein

Inter-Wood-Maschinen GmbH & Co. KG

of

Am Bahnhof 5
8923 Lechbruck am See
Federal Republic of Germany

do solemnly and sincerely declare as follows:

1. I am/we are the applicant(s) for the patent

(or, in the case of an application by a body corporate)

1. I am/we are authorised by Inter-Wood-Maschinen GmbH & Co. KG

the applicant(s) for the patent to make this declaration on its/their behalf.

2. The basic application(s) as defined by Section 141 of the Act was/were made

in Federal Republic of Germany

on March 17, 1983

by Inter-Wood-Maschinen GmbH & Co. KG

3. I am/we are the actual inventor(s) of the invention referred to in the basic application(s)

(or where a person other than the inventor is the applicant)

1. Karl Schäfer
2. Heinz Stein

of

1. Care of Inter-Wood-Maschinen GmbH & Co. KG, Am Bahnhof 5,
8923 Lechbruck am See, Federal Republic of Germany
2. Hemmerder Hellweg 3
4750 Unna-Hemmerde, Federal Republic of Germany (respectively)

are the actual inventor(s) of the invention and the facts upon which the applicant(s) is/are entitled to make the application are as follows:

The applicant is the assignee of the invention from the inventors.

4. The basic application(s) referred to in paragraph 2 of this Declaration was/were the first application(s) made in a Convention country in respect of the invention(s) the subject of the application.

Declared at Lechbruck this 26th day of February, 1983

Signature of Inter-Wood-Maschinen

Tw: The Commissioner of Patents

SPP4
REPLACING WORN KNIVES IN A DESINTEGRATOR OR CHIP FLAKER IN THE COURSE OF OPERATION

INTER-WOOD-MASCHINEN GmbH AND CO. KG.

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KARL SCHAFER AND HEINZ STEIN
SF

Claim

1. Method of producing particulate material in a desintegrator, especially of flakes in a chip flaker, wherein the desintegrator or, respectively, the chip flaker is fitted with knives, characterised in that the respective worn knives in use are being replaced either continuously or at regular time intervals by sharp knives in the course of operation.
Complete Specification for the invention entitled:

"METHOD OF PRODUCING PARTICULATE MATERIAL, ESPECIALLY FLAKES, AND DEVICE FOR PERFORMING THE METHOD"

The following statement is a full description of this invention, including the best method of performing it known to us.
ABSTRACT

The invention relates to a method by which the worn knives which are in use in a desintegrator or chip flaker are replaced in the course of operation either continuously or at measured intervals by sharp knives. Preferably, the knives are advanced dependent on the passage of time and/or the consumption of energy.

The device used for performing the method is characterised in that one or several magazines for storing the knives are arranged in longitudinal direction of the knife ring.
DE-OS 26 28 773 discloses a generic chip flaker to reduce the size of chips, said chip flaker comprising a fixed cylindrical knife ring fitted at equal intervals with removable knives on its inside surface. A chip transporting device equipped with air vanes and adjustable counter knives rotates in the knife ring. Under the influence of the air current, drawn in by the air vanes, and of the centrifugal force, the chips are placed in front of the knife edges in largely parallel grain alignment in such a manner that they are divided into thin flakes in grain direction.

It is a disadvantage of this known chip flaker that it is necessary at the end of their tool life for the knives to be laboriously dismantled, resharpened and subsequently reassembled. Even if, at the end of the tool life, the complete knife ring is dismantled and replaced by a knife ring with sharp knives, as provided for in DE OS 26 28 773, this still involves the replacement outside the chip flaker of all blunt knives by sharp knives.

It is therefore the object of the invention to provide a method and a device of the above type that assures continuous operation for the longest possible period.

The invention solves this problem by a method whereby the worn out knives being used are removed and replaced with sharp knives during operation either continuously or at measured intervals. Preferably the knife replacement is
performed with reference to the flow of time and/or the consumption of energy.

The device used for carrying out the method of the invention is characterised in that one or a plurality of magazines for storing the knives is arranged in longitudinal direction of the knife ring. If the knives are strip steel knives, each strip steel knife can be unwound from rolls and guided to its clamping plates in endless lengths, while it is being wound on to a further roll on the withdrawal side. The advance of the knives or, respectively, of the strip steel knives, can be facilitated by impressing recesses or perforations into the knives on either side of their longitudinal axis, so that a corresponding feed mechanism can enter into engagement therewith.

In another embodiment blade lengths of this type are stacked in magazines whence they are supplied to the clamping plates via corresponding feeding devices or pull through devices, and the magazine can be movably arranged in such a way that all knives are successively supplied to their respective clamping plates. Finally, if the universal magazine is stationary, the knife ring can be rotatably mounted in a manner known per se, in order to make possible the provision with new knives.

It is a particular advantage of the method according to the invention that thanks to the knives being supplied continuously or at regular intervals, it is no longer necessary to replace the knives and interrupt production. In addition, this method provides for the production of particulate material of constant quality and predetermined particle size, insofar as in accordance with the invention
the two factors, i.e., particle quality and energy consumption, are brought into a constant relation that meets the economic and technological requirements.

In accordance with the invention it is also possible in the production of flakes in a chip flaker to flake cheap wood to flakes of predetermined length and constant quality, and there is a particularly favourable relationship between flake quality and energy consumption.

In the following the invention is described in greater detail with reference to the attached illustrations of a chip flaker equipped with strip steel knives, wherein:

Fig. 1 is a cross section of the chip flaker, transversely to the rotation axis of the chip conveying device,

Fig. 2 is an enlarged cross section of a knife ring segment, transversely to the rotation axis of the chip conveying device, and equipped with a knife clamping device,

Fig. 3 is a longitudinal section of the chip flaker, parallel to the rotation axis of the chip flaking device, comprising only one strip steel roll each on the supply side or, respectively, on the withdrawal side,

Fig. 4 is a longitudinal section through the chip flaker, parallel to the rotation axis of the chip flaking device in the vicinity of the magazine with feeding device and pullthrough device as installed on the supply side and the withdrawal side, and

Fig. 5 is a plan view of the steel strip knife with the impressed recesses or perforations.

The chip flaker 3 is made up of a fixed cylindrical knife ring 4 with a chip feeding device 5 equipped with counter knives 6 that are movably suspended by their swivel
axes 23. On its inside surface knife ring 4 is furnished at symmetric intervals with knife clamping devices 8, essentially consisting of two clamping plates 8a and 8b in each case. Clamping plate 8a is held by a tension spring 22. Strip steel knives 1 have a centering groove 20 wherein springs 21 are engaged, said springs being replaceably arranged in clamping plate 8a, which latter is also constructed as a replaceable part that is subject to wear. A gap, permitting the flakes to pass through, is formed between clamping plate 8b and the wear resisting lip 8c arranged opposite the former. The strip steel knives 1 can be fitted with spikes 12. In addition, they are provided along either side of their longitudinal axis 13 with recesses or perforations 14, in which a correspondingly designed insertion device or pull through device 19 engages. Strip steel knives 1 are guided to the insertion device or the pull through device 19 by roll 15, are wound up on a roll 16 on the output side, while being clamped between clamping plates 8a and 8b. Alternatively, the strip steel knives 1 can be supplied to clamping plates 8a and 8b in lengths equalling a single fraction or a multiple of a blade section 2 being used.

Blade sections 2 are stacked in magazines 17 and are supplied from there by slide in devices or, respectively, pull through devices 19 to respective clamping plates 8a and 8b. Magazine 17 can also be movably arranged so that the strip steel knives 1 are successively supplied to their respective clamping plates 8a and 8b. When the magazine is stationary knife ring 4 can be rotatably mounted in known manner and, at fixed time intervals, be brought into a position in which no strip steel knives are supplied.
CLAIMS

7. The desintegrator of claim 1, wherein the desintegrator includes a desintegrating element that on the first end is furnished with either unwound or wound-in-place clamping plates.

6. The desintegrator of claim 5, wherein the desintegrator includes a desintegrating element that on the first end is furnished with clamping plates in longitudinally disposed intervals with intervals between said clamping plates being so disposed that the advancing of the passage can be performed with a fixed conveying device.

5. The desintegrator of claim 4, wherein the desintegrator includes a desintegrating element that on the first end is furnished with clamping plates in longitudinally disposed intervals with intervals between said clamping plates being so disposed that the advancing of the passage can be performed with a fixed conveying device.

4. The desintegrator of claim 3, wherein the desintegrator includes a desintegrating element that on the first end is furnished with clamping plates.

3. The desintegrator of claim 2, wherein the desintegrator includes a desintegrating element that on the first end is furnished with clamping plates.

2. The desintegrator of claim 1, wherein the desintegrator includes a desintegrating element that on the first end is furnished with clamping plates.

1. The desintegrator is in use.
The claims defining the invention are as follows:

1. Method of producing particulate material in a desintegrator, especially of flakes in a chip flaker, wherein the desintegrator or, respectively, the chip flaker is fitted with knives, characterised in that the respective worn knives in use are being replaced either continuously or at regular time intervals by sharp knives in the course of operation.

2. Method according to claim 1, characterised in that the advance of the knives takes place with reference to the passage of time and/or the consumption of energy.

3. A device for performing the method of claim 1 with a desintegrator or, respectively, a chip flaker, comprising a fixed cylindrical knife ring with knives and a rotating conveying device with cutting elements throwing the material to be particulated against the blades of the knives, the inner surface of the knife ring being furnished at symmetrical intervals with knife clamping devices composed of two clamping plates each, characterised in that there are arranged in longitudinal direction of the knife ring one or several magazines for storing the knives.

4. A device according to claim 3, characterised in that on either side of its longitudinal axis the knife is furnished with recesses or perforations.

5. A device according to claims 3 or 4, characterised in that the knives are strip steel knives.

6. A device according to claim 5, characterised in that on the feed side and on the removal side the magazine is furnished with a roll from which the strip steel knife is either unwound or, respectively, on to which it is wound.

7. A device according to any one of claims 3 to 6, characterised in that the magazine is rotatable in the magazine device or, respectively, the knives to the magazine.
characterised in that on the feed side the knives are stored in the magazine, and in that there is provided a slide-in device or, respectively, a pull through device to supply the knives to the clamping plates.

8. A device according to claim 7, characterised in that the magazine is movable, so that the knives can be supplied successively to the clamping plates.

9. A device according to claim 7, characterised in that the magazine is stationary, while the knife ring is rotatable in a manner known per se.

DATED this FOURTEENTH day of MARCH, 1984

Inter-Wood-Maschinen GmbH & Co. KG

Patent Attorneys for the Applicant

SPRUSON & FERGUSON
Fig. 3

Fig. 4