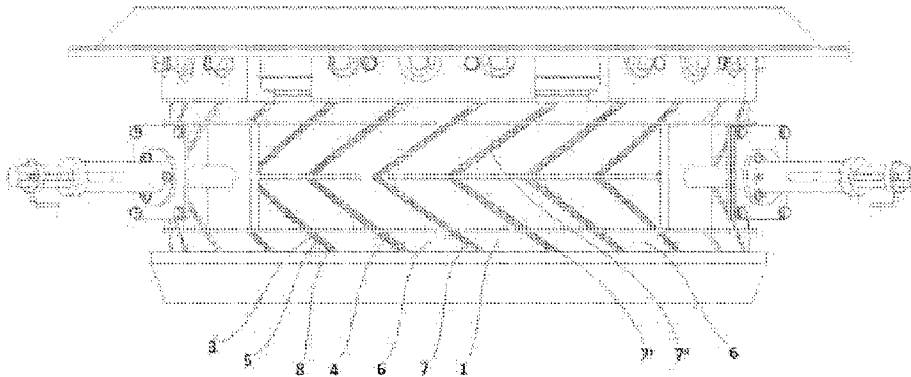




(86) Date de dépôt PCT/PCT Filing Date: 2020/05/06
 (87) Date publication PCT/PCT Publication Date: 2020/11/12
 (45) Date de délivrance/Issue Date: 2024/06/04
 (85) Entrée phase nationale/National Entry: 2021/09/16
 (86) N° demande PCT/PCT Application No.: NL 2020/050287
 (87) N° publication PCT/PCT Publication No.: 2020/226493
 (30) Priorité/Priority: 2019/05/08 (NL2023087)

(51) Cl.Int./Int.Cl. *B30B 11/22* (2006.01)
 (72) Inventeurs/Inventors:
 VAN LINDENBERG, JAN-WILLEM, NL;
 MEIJER, LUKAS, NL;
 BINDELS, MAURICE, NL
 (73) Propriétaire/Owner:
 CPM EUROPE B.V., NL
 (74) Agent: MOFFAT & CO.

(54) Titre : ENSEMBLE PRESSE DE PASTILLAGE ET DISPOSITIF DE CONCASSAGE DE PASTILLES MONTE SUR LA PRESSE DE PASTILLAGE
 (54) Title: AN ASSEMBLY OF A PELLET PRESS AND A PELLET BREAKING DEVICE MOUNTED ON THE PELLET PRESS BREAKING DEVICE



(57) **Abrégé/Abstract:**

An assembly of a pellet press (2) and a pellet breaking device (1) mounted on the pellet press (2), said pellet press having a cylindrical outer wall (3) with a series of radial through holes (4) for pressing the pellets from within the press (2) towards and away from an outer circumferential contour (5) of the pellet press (2). The breaking device (1) comprises a plate (6) at a predefined distance from the outer circumferential contour (5) of the pellet press (2). The plate (6) is equipped with a series of slits (7) providing to the pellets a release-way away from the pellet press (2). The slits (7) are provided in two series (7', 7'') with mirror image orientations that are pointing towards each other.

ABSTRACT

An assembly of a pellet press (2) and a pellet breaking device (1) mounted on the pellet press (2), said pellet press having a cylindrical outer wall (3) with a series of radial through holes (4) for pressing the pellets from within the press (2) towards and away from an outer circumferential contour (5) of the pellet press (2). The breaking device (1) comprises a plate (6) at a predefined distance from the outer circumferential contour (5) of the pellet press (2). The plate (6) is equipped with a series of slits (7) providing to the pellets a release-way away from the pellet press (2). The slits (7) are provided in two series (7', 7'') with mirror image orientations that are pointing towards each other.

An assembly of a pellet press and a pellet breaking device mounted on the pellet press breaking device

The invention relates to an assembly of a pellet press and a pellet breaking device mounted on the pellet press, said pellet press being equipped with a cylindrical outer wall that is provided with a series of radial through holes for radially
5 and outwardly pressing the pellets from within the press towards and away from an outer circumferential contour of the pellet press, wherein said breaking device is provided at a predefined distance from the outer circumferential contour of the pellet press.

10 EP-A-2 727 715 discloses a pellet breaking device. The known pellet breaking device is equipped with pellet cutting means and at least one attachment region in which the cutting means are attached on a fixed housing part of the pellet press such that the cutting means can be arranged at a predefined
15 space from the pellet press. The cutting means has a concave arcuate contour which is substantially helical over at least a region of one of the radial through-holes of the ring die of the pellet press, so that a pellet, via the ring die in the radial direction and with a greater length than the distance between
20 the ring die and the cutting means protrudes from the through hole, then in the region of its free end comes to rest on a base body with a concave circular-arc radial guide surface on which the cutting means is mounted, and can move along the circumferential direction of the base body such that the pellet is de-
25 flected by the cutting means by means of a force having an axial component, so that the pellet kinks in the region of the ring die.

The invention has as an object to depart from the complicated and heavy design known from EP-A-2 727 715, and to provide a pellet breaking device which is contrary to the known device energy-efficient and reliable in providing pellets of well-
30 defined length within a limited length-range as are required when manufacturing pellets to be used as feedstock for living animals. A maximum length of such pellets is approximately 5 mm with 2 - 3.5 mm diameter, or a maximum of 20 mm with 2 - 8 mm
35 diameter. This type of pellets is suitable for feedstock for living animals and cannot be manufactured with the device known

from EP-A-2 727 715. The reason is that this known device cannot handle the capacity and length as required for manufacturing pellets which are to be used as feedstock for living animals.

5 The pellets have to be of limited length, but a problem in the prior art when manufacturing those limited length pellets is that a lot of fines are produced which is detrimental for the energy efficiency of the process.

10 It is therefore an object of the invention to provide a pellet breaking device for manufacturing pellets with the mentioned limited length, wherein the not intended production of fines is as much as possible prevented.

15 Another object of the invention is that by reducing the production of fines, the overall capacity of the pellet breaking device of the invention for the production of pellets is increased, since there are less fines required to feed back into the manufacturing process, and the energy consumption per unit of manufactured pellets can be accordingly lowered.

20 FR 3 028 446 discloses a machine for manufacturing granules by pressing a pulverulent material, said machine comprising a frame defining an enclosure; a perforated annular die mounted in the enclosure and driven in rotation relative to the frame; at least one pressure roller mounted in the die in the vicinity of an internal face thereof; and a device for cutting granules comprising a grid which extends at least partially
25 around the die opposite an external face thereof.

30 In a first aspect of the invention the breaking device comprises a plate encircling the pellet press at a predefined distance from the outer circumferential contour of the pellet press, and that said plate is equipped with a series of slits providing to the pellets a release-way away from the pellet
35 press, wherein said slits span at least a part of the outer circumferential contour of the pellet press along an area that is provided with said through holes, and that the slits are provided in two series with mirror image orientations that are pointing towards each other.

40 The plate has the functionality to smoothly break the pellets when they leave the through holes of the pellet press while they are still hot. This reduces the production of fines which conventionally occurs when the pellets are broken after they are cooled down. The slits in turn provide a release way

for the broken pellets, that have just escaped from the through holes in the pellet press and are broken by the action of the plate. Providing the slits in two series with mirror image orientations enable the cut pellets to divert to two distinct directions, instead of all going to the same side, thus reducing contact between said pellets and minimalizing damage to the pellets. This promotes the reduction of fines and improves the pellet quality.

5
10 Preferably the slits in each series are mutually parallel.

In one embodiment it is found that the best results may be achieved when the slits that are pointing towards each other in different orientations enclose an angle between the slits in a range between 60 and 80°. Particularly this angle is found beneficial to assure a gentle, partly side-ways, breaking action of the pellets, thus reducing the fines and improving the pellet quality.

To secure a high enough production capacity of the pellet press on which the pellet breaking device is mounted, the slits have a width spanning at least three neighbouring through holes.

It is found advantageous that the slits are obliquely oriented with reference to a longitudinal body axis of the pellet press. This promotes the gradual release of the broken pellets from the pellet press.

In order to be able to manufacture pellets with variable length it is preferable that the distance at which said plate encircles the pellet press is adjustable.

In a broad aspect, the present invention provides an assembly of a pellet press 2 and a pellet breaking device 1 mounted on the pellet press 2, said pellet press 2 being equipped with a cylindrical outer wall 3 that is provided with a series of radial through holes 4 for radially and outwardly pressing pellets from within the press 2 towards and away from an outer circumferential contour 5 of the pellet press 2, wherein said breaking device 1 comprises a plate 6 encircling the pellet press 2 at a predefined distance from the outer circumferential contour 5 of the pellet press 2 and that said plate 6 is equipped with a series of slits 7 providing to the pellets a release-way away from the pellet press 2, wherein said slits 7

span at least a part of the outer circumferential contour 5 of the pellet press 2 along an area 8 that is provided with said through holes 4, wherein the slits 7 are provided in two series (7', 7'') with mirror image orientations that are pointing towards each other, characterized in that the slits 7 that are pointing towards each other in different orientations enclose an angle between the slits 7 in a range between 60 and 800.

The invention will hereinafter be further elucidated with reference to a drawing of a non-limiting exemplary embodiment of the pellet breaking device and its use in accordance with the invention.

In the drawing:

- figure 1 shows a pellet press provided with a pellet breaking device of the invention in an isometric view;
- figure 2 shows a side view at the pellet breaking device of the invention; and
- figure 3 shows an oblique view at the pellet breaking device of the invention.

Whenever in the figures the same reference numerals are applied, these numerals refer to the same parts.

Figure 1 shows a pellet breaking device 1 mounted on a

pellet press 2, said pellet press 2 being equipped with a cylindrical outer wall 3. Figures 2 and 3 provide a view at the cylindrical outer wall 3 underneath the pellet breaking device 1, wherein it is shown that the cylindrical outer wall 3 is provided with a series of radial through holes 4 for radially and outwardly pressing the pellets from within the press 2 towards and away from an outer circumferential contour 5 of the pellet press 2.

The breaking device 1 is provided at a predefined distance from the outer circumferential contour 5 of the pellet press 2, and comprises a plate 6 encircling the pellet press 2 at said predefined distance from the outer circumferential contour 5 of the pellet press 2. The plate 6 is equipped with a series of slits 7 providing to the pellets a release-way away from the pellet press 2, wherein said slits 7 span at least a part of the outer circumferential contour 5 of the pellet press 2 along an area 8 that is provided with said through holes 4. It is remarked that the distance at which the plate 6 encircles the pellet press 2 is adjustable.

It can be seen in figure 2 and in figure 3 that the slits 7 have a width spanning at least three neighbouring through holes 4.

It is clear from both figure 2 and figure 3 in combination with figure 1 that the slits 7 are obliquely oriented with reference to a longitudinal body axis of the pellet press 2.

Further it shows that the slits 7 are provided in two series 7', 7'' with mirror image orientations that are pointing towards each other, and that the slits 7 in each serie 7', 7'' are mutually parallel. Further it is remarked that the slits 7 that are pointing towards each other in different orientations enclose an angle between the slits 7 in a range between 60 and 80°.

Although the invention has been discussed in the foregoing with reference to an exemplary embodiment of the pellet breaking device of the invention, the invention is not restricted to this particular embodiment which can be varied in many ways without departing from the invention. The discussed exemplary embodiment shall therefore not be used to construe the appended claims strictly in accordance therewith. On the contrary the embodiment is merely intended to explain the wording of the appended claims without intent to limit the claims to this exem-

plary embodiment. The scope of protection of the invention shall therefore be construed in accordance with the appended claims only, wherein a possible ambiguity in the wording of the claims shall be resolved using this exemplary embodiment.

CLAIMS

1. An assembly of a pellet press (2) and a pellet breaking device (1) mounted on the pellet press (2), said pellet press (2) being equipped with a cylindrical outer wall (3) that is provided with a series of radial through holes (4) for radially and outwardly pressing pellets from within the press (2) towards and away from an outer circumferential contour (5) of the pellet press (2), wherein said breaking device (1) comprises a plate (6) encircling the pellet press (2) at a predefined distance from the outer circumferential contour (5) of the pellet press (2) and that said plate (6) is equipped with a series of slits (7) providing to the pellets a release-way away from the pellet press (2), wherein said slits (7) span at least a part of the outer circumferential contour (5) of the pellet press (2) along an area (8) that is provided with said through holes (4), wherein the slits (7) are provided in two series (7', 7'') with mirror image orientations that are pointing towards each other, **characterized in that** the slits (7) that are pointing towards each other in different orientations enclose an angle between the slits (7) in a range between 60 and 80° .

2. Assembly according to claim 1, **characterized in that** the slits (7) in each series of slits (7', 7'') are mutually parallel.

3. Assembly according to claim 1 or 2, **characterized in that** the slits (7) have a width spanning at least three neighbouring through holes (4).

4. Assembly according to any one of claims 1 - 3, **characterized in that** the slits (7) are obliquely oriented with reference to a longitudinal body axis of the pellet press (2)).

5. Assembly according to any one of claims 1 - 4, **characterized in that** the distance at which said plate (6) encircles the pellet press (2) is adjustable.

