

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
01.08.2007 Bulletin 2007/31

(51) Int Cl.: **B07B 1/20**^(2006.01) **B08B 15/02**^(2006.01)

(21) Application number: **07100954.2**

(22) Date of filing: **23.01.2007**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
 HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI
 SK TR**
 Designated Extension States:
AL BA HR MK YU

(72) Inventor: **Kivimäki, Jorma**
28260 Harjunpää (FI)

(74) Representative: **Savolainen, Seppo Kalevi**
Kolster Oy Ab
Iso Roobertinkatu 23,
P.O. Box 148
00121 Helsinki (FI)

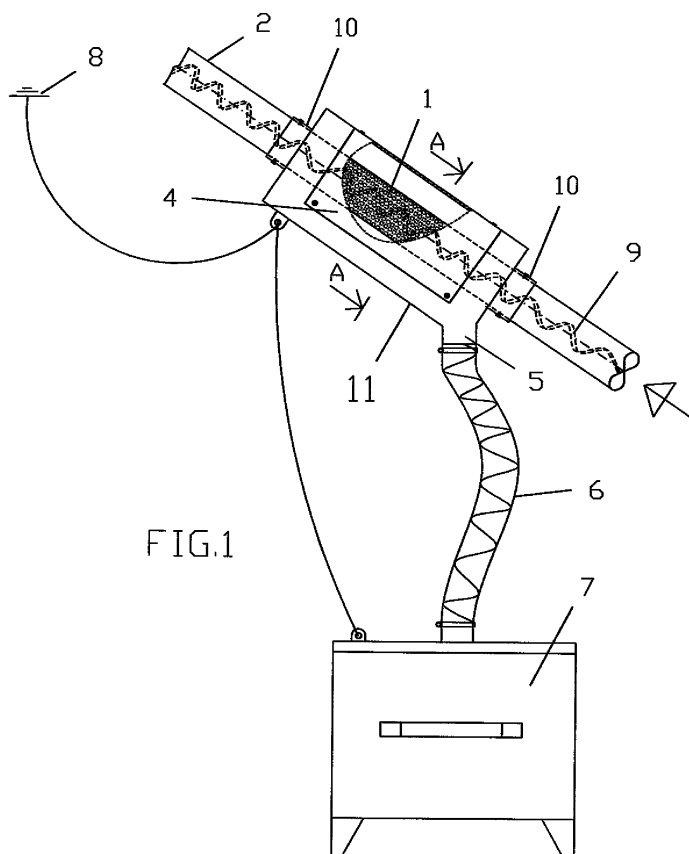
(30) Priority: 25.01.2006 FI 20060039 U

(71) Applicant: **Kivimäki, Jorma**
28260 Harjunpää (FI)

(54) **Fines separator**

(57) The invention relates to a fines separator of a spiral or screw conveyor, comprising a perforated tube (1) attached into a dust-proof casing (3), attaching parts

(10) fixedly attached to both ends of the casing (3) and the ends of the perforated tube (1), and a discharge opening (5) in the lower part of the casing (3).



Description

[0001] The present invention relates to a fines separator of a spiral or screw conveyor used for transferring fuel pellets.

[0002] Fines among pellets cause problems in feeding apparatuses by blocking up a spiral or screw conveyor and making burner ends dirty during pellet burning and increasing particulate emissions along with flue gases into the environment. It is known to cleanse and sort grain by means of a screen mounted in the screw conveyor. These screens are made of two similar perforated parts with semi-circular cross-sections, the edges of which comprise folds in the longitudinal direction for bolt tightening. The use of such a screen for separating fines of the pellets causes a problem that the fines of the pellets are accumulated in a slot at the fastening point and thus block up the conveyor. Furthermore, the need for collecting the separated fines and dust as a closed system has not been taken into account in grain cleansing screens. Thus, they are not suitable for separating fines of fuel pellets.

[0003] The fines separator of the invention is characterized in what is disclosed in the characterizing part of claim 1.

[0004] The separator of the invention provides a plurality of considerable advantages. The separator removes fines from pellets. This prevents the blocking of the feeding apparatuses and the burner end from becoming dirty. A pellet without fines contains more air, wherefore the burning is more complete. Due to this, there are also fewer particulate emissions. Each part of the separator is anti-arching screened with earth cables, and thus its use is safe. Since all structures of the separator are dust-proof, it may be mounted in a boiler room without a risk of fire. The separator is small so it is particularly suitable for domestic use and can be mounted easily in narrow places.

LIST OF FIGURES

[0005]

Figure 1 shows a side view of a fines separator of the invention partially in section;

Figure 2 is an enlarged section A - A of Figure 1.

[0006] A fines separator 11 is attached by means of its attaching parts 10 to an outer jacket tube 2 of a spiral conveyor at an advantageously selected point. The separator 11 consists of a perforated tube 1, a separator casing 3, a separator service hole and lid 4, a separator discharge opening 5, a preferably flexible tube 6 connected to the discharge opening 5 and a receiver 7, the receiver 7 and an earth cable 8, by which the separator 11 and the receiver 7 are earthed. When the separator 11 is attached to the outer jacket tube 2 of the spiral conveyor, a piece of the size of the perforated tube 1 is

cut off from the outer jacket tube 2. A spiral 9 of the spiral conveyor extends through the outer jacket tube 2 and the perforated tube 1 of the separator 11. As the spiral 9 rotates, it feeds the pellets from a storage bin to the burner end of a heating boiler or a heating device of another type. In the example case, as the spiral of the spiral conveyor rotates, the pellets to be transferred travel upwards and fines flow from the holes of the perforated tube 1 down to the casing 3 and through the discharge opening 5 along the tube 6 into the receiver 7. The inner diameter of the perforated tube 1 equals to that of the outer jacket tube 2 of the spiral tube, in the example case the holes of the perforated tube 1 have a round shape. The casing 3 to be mounted around the perforated tube 1 protects the environment from dust and other fines parts. The attaching parts 10 are fixedly attached to the ends of the casing 3 and the ends of the perforated tube 1. The separator 11 is attached by means of the attaching parts 10 to the outer jacket tube 2 of the spiral conveyor. The inner diameter of the attaching part 10 equals to the outer diameter of the outer jacket tube 2. The separator 11 may be cleaned through the service hole and lid 4 provided in the casing 3. The separator 11 and the receiver 7 are earthed by the earth cable 8 to prevent sparking caused by static electricity and to prevent the accumulation of dust in the separator 11.

[0007] Other solutions deviating from the above are also feasible within the scope of the invention. Thus, depending on the characteristics of the fines to be separated the holes of the perforated tube 1, for instance, may vary in shape and size and the dust-proof casing 3 may be split in the longitudinal direction.

Claims

1. A fines separator of a spiral or screw conveyor, **characterized in that** it comprises a perforated tube (1) attached into a dust-proof casing (3), attaching parts (10) fixedly attached to both ends of the casing (3) and the ends of the perforated tube (1), and a discharge opening (5) in the lower part of the casing (3).
2. A fines separator as claimed in claim 1, **characterized in that** the discharge opening (5) and a receiver (7) are joined by a tube (6).
3. A fines separator as claimed in claim 1, **characterized in that** the casing (3), the perforated tube (1) and the receiver (7) are earthed by an earth cable (8).
4. A fines separator as claimed in claim 1, **characterized in that** the dust-proof casing (3) comprises a service hole and lid (4).

