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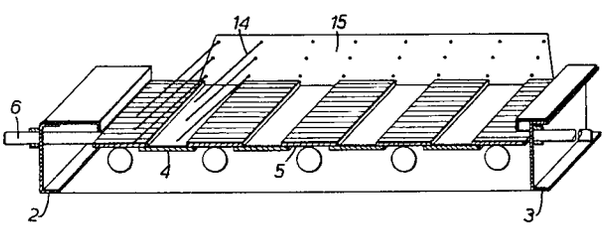
(54) Grating slide.

(57) Grating slide for the delivery of material from a silo or the like comprising a fixed bottom grating (4) and an apertured top grating (5) adapted to reciprocate with respect to the bottom grating whereby with the top grating are connected members located above the grating and formed by strips (14) connected with the top grating and disposed, viewed on plan, at least substantially perpendicularly above the passages in the top grating in order to act on the material contained in a silo or the like.



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Grating slide

The invention relates to a grating slide for delivering material from a silo or the like comprising a fixed bottom grating and an apertured top grating adapted to reciprocate with respect to the bottom grating.

Such a grating slide is known, for example, from Dutch Patent Application 6906937. In such grating slides the top grating is displaceable between a completely closed state of the grating slide and a completely open state of the grating slide, whilst in many cases, when the grating slide is wholly or partly opened, the top grating can still be rapidly reciprocated with respect to a given medium position. Such grating slides are, for example, very suitable for fast and accurately dosed delivery of material from the silo or the like.

In such silos are often stored powdery materials whose internal cohesion may vary, for example, may have strongly increased when the material has been stored in the silo for a given time, whilst the cohesion may furthermore be affected by temperature and humidity. It, therefore, often occurs that, when the grating slide is opened to deliver material from the silo, the material does not immediately flow away, but is retained in the silc . After some time, however, gravity may be able to overcome the cohesion of the material so that this material abruptly drops down, which may give rise to fluidization phenomena in the material moving through the opened grating slide. This particularly occurs when the slide is completely open.

Obviously, such a spontaneous delivery of material is particularly undesirable when accurately dosed delivery on a weighing device is concerned.

The invention has for its object to provide a grating slide of the kind set forth, by which such inconvenient phenomena can be avoided.

According to the invention this can be achieved by connecting with the top grating members located above the grating and formed by strips fastened to the top grating and disposed, viewed on plan, at least substantially perpendicularly above the passages of the top grating for acting on the material contained in a silo or the like. As soon as the top grating is moved for opening the grating slide, the strips will act on the material located above the top grating in order to disturb the cohesion of this material so that the risk of retention of the material is avoided, whilst the strips constitute, in addition, a kind of screen for the passages of the top plate located beneath the strips, which has an advantageous effect on a controlled delivery of the material through these apertures.

The invention will now be described more fully with reference to a few embodiments of the construction according to the invention schematically shown in the accompanying Figures.

Fig. 1 is a sectional view of a first embodiment of a grating slide in accordance with the invention.

Fig. 2 is a sectional view of a second embodiment of a grating slide in accordance with the invention.

Fig. 3 is a sectional view of a third embodiment of a grating slide in accordance with the invention.

Fig. 4 is a sectional view of a fourth embodiment of a grating slide in accordance with the invention.

Referring to Fig. 1, a grating slide comprises a rectangular frame formed by two parallel, longitudinal beams 1 interconnected by transverse beams 2 and 3 extending at right angles to the end of the longitudinal beams 1. The grating slide is provided with a fixed bottom grating formed by a plurality of parallel, relatively spaced, horizontal strips 4 extending between the longitudinal beams 1. The top grating is formed by a plurality of parallel, relatively spaced strips 5 interconnected with the aid of a tie rod 6, which extends parallel to the longitudinal beams 1 and which can be reciprocated in known manner by means not shown. In the position shown in Fig. 1, the strips 5 of the reciprocatory top grating cover the passages of the grating slide located at the side of and between the

strips 4 so that in this position of the top grating no material can be delivered from a silo or the like, the bottom side of which is provided with the grating slide shown in Fig. 1. To the strips 5 are fastened upwardly extending supports 16, with the aid of which strips 17 extending parallel to the strips 5 are connected with the strips 5. The disposition of the strips 17 is such that, viewed on plan, a strip 17 covers at least substantially completely an interstice between two neighbouring strips 5.

As soon as the top grating is displaced with the aid of the rod 6 connecting the strip 5 out of the closed position shown in Fig. 1 to an opened position in which the top grating may be continually reciprocated, the supports 16 and the strips 17 will immediately act as cutting and scraping members on the material directly located above the top grating, so that the cohesion of this material is disturbed and the material can flow away as soon as the passages of the grating slide are released to some extent by the strips 5. The strips 17 then not only have an efficient loosening effect on the material located above the top grating in the silo or the like, when said top grating is displaced, but they also prevent the material, when the grating slide is opened, from flowing at a high rate through the interstices released by the strips 5 between the strips 4, since the strips 17, so to say, have a discharging effect on the pressure exerted on the material passing through said openings. In the embodiments to be discussed more fully hereinafter, those parts which correspond with the parts referred to in Fig. 1 have the same reference numerals and a further description of the construction or disposition of these parts is believed to be redundant.

As is shown in Fig. 2, grate-shaped strips 18 may be used rather than closed strips 17 and be formed by a plurality of narrow parallel strips so that the material can also flow through said grate-shaped strips.

Fig. 3 shows an embodiment corresponding with the embodiment shown in Fig. 1 of a grating slide, in which helical springs D are arranged between the upwardly extending supports. It will be obvious that the material located above the reciprocatory top grating can thus be very intensively influenced.

When the top grating is displaced, the turns of the helical springs 19 will also affect the material located above the tope grating for brea-

king up the cohesion of said material. The spring 19 preferably has such spring properties that upon such a displacement of the top grating it will start slightly vibrating. If the system in which the grating slide is incorporated is constructed so that in the desired, opened position of the grating slide the top grating is caused to move around a medium position, both the strips and the helical springs will continue exerting an advantageous agitating effect on the material, which contricutes to a regular, undisturbed flow of material from a silo or the like.

Fig. 4 shown an embodiment roughly corresponding with the embodiment shown in Fig. 3, but further helical springs 20 are provided above the strips 17. It will be obvious that in this construction the material can be affected up to a fairly great height above the reciprocatory top grating by the various members arranged above the top grating.

As a matter of course, further combinations of the above-described structural details of the various embodiments are possible and within the spirit and scope of the invention further supplements and/or modifications of the constructions described and illustrated may be designed. The choice of the members employed will also depend on the material to be processed.

In the embodiments shown it is, for example, possible to arrange the strips 17 so as to be adjustable and/or independantly displaceable with respect to the strips 5.

CLAIMS.

Claims

1. A grating slide for the delivery of material from a silo or the like comprising a fixed bottom grating and an apertured top grating adapted to reciprocate with respect to the bottom grating characterized in that with the top grating are connected members located above the grating and formed by strips connected with the top grating and disposed, viewed on plan, at least substantially perpendicularly above the passages in the top grating in order to act on the material contained in a silo or the like.

2. A grating slide as claimed in Claim 1 characterized in that the members acting on the material contained in a silo or the like comprise helical springs.

3. A grating slide as claimed in Claim 2 characterized in that the centre lines of the helical springs extend parallel to the direction of displacement of the top grating.

4. A grating slide as claimed in anyone of the preceding Claims characterized in that the strips connected with the top grating have apertures.

5. A grating slide as claimed in anyone of the preceding Claims characterized in that the strips connected with the top grating are adjustable with respect to the top grating.

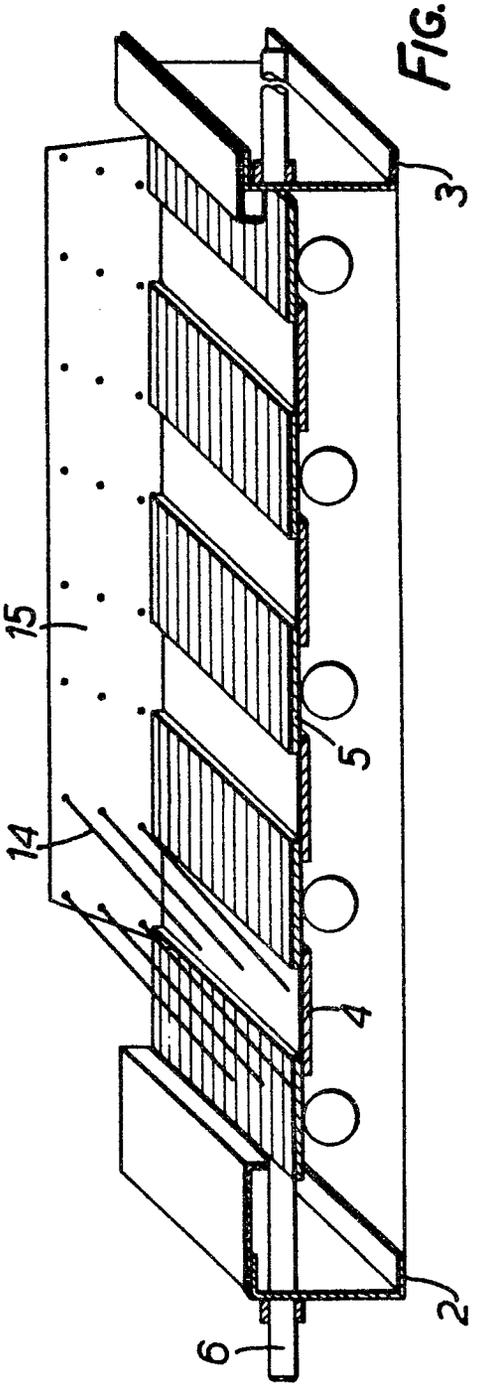

FIG. 1.

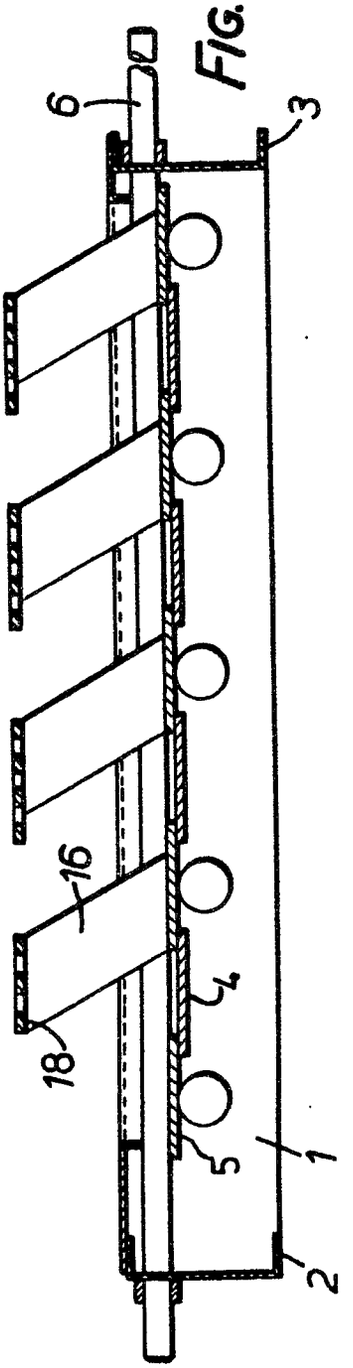

FIG. 2.

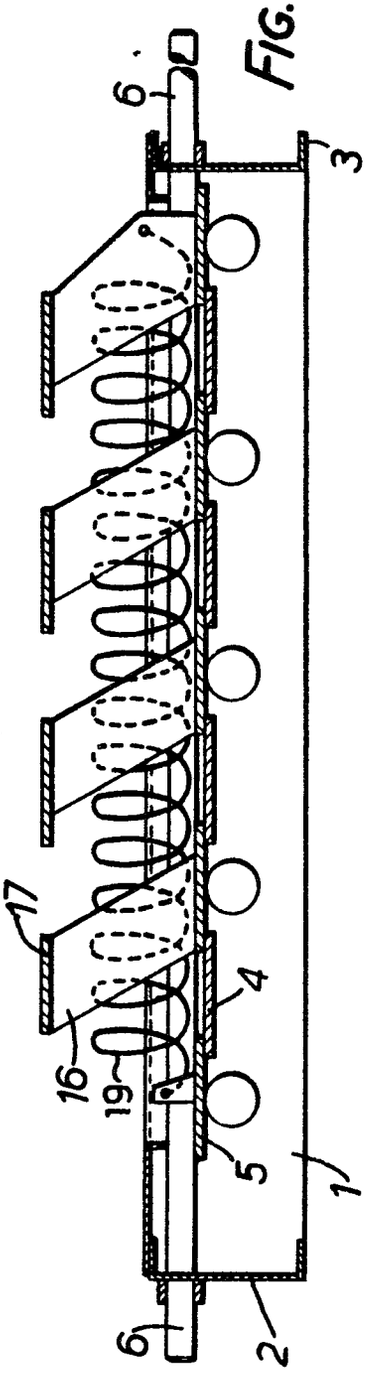

FIG. 3.

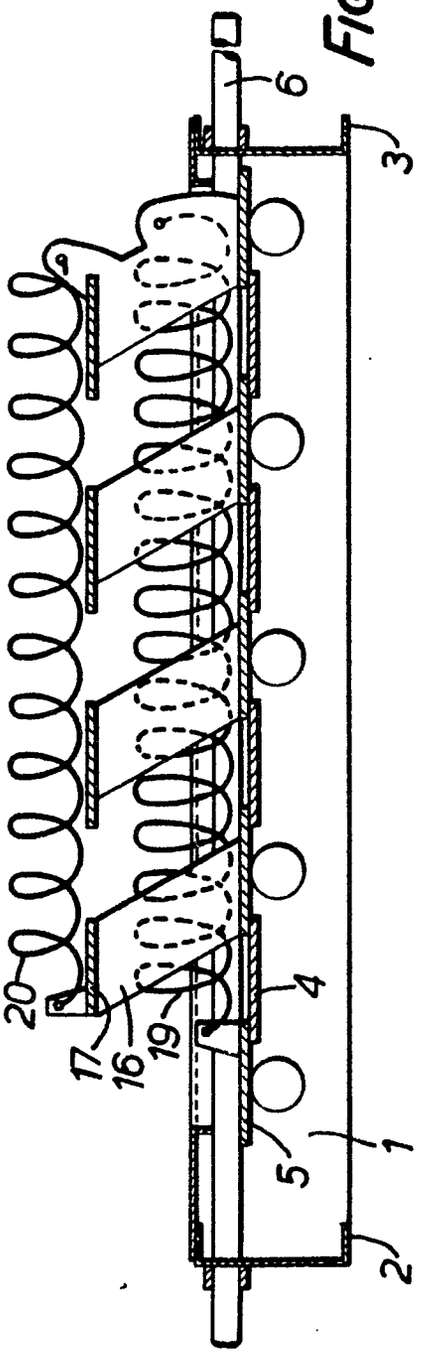

FIG. 4.

European Patent Office

EUROPEAN SEARCH REPORT

Application number
0036695
EP 81 20 0308

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
A AD	FR - A - 2 060 007 (ALFRA) & NL - A - 69 06937	
A	CH - A - 510 577 (BUHLER)	
A	NL - A - 69 01932 (HUDER)	
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	US - A - 4 176 767 (FRANCHE) * Column 4, lines 1-35; figures 2,3 *	2

CLASSIFICATION OF THE APPLICATION (Int. Cl.³)

B 65 D 90/60
88/66

TECHNICAL FIELDS SEARCHED (Int. Cl.³)

B 65 D

CATEGORY OF CITED DOCUMENTS

X: particularly relevant
A: technological background
O: non-written disclosure
P: intermediate document
T: theory or principle underlying the invention
E: conflicting application
D: document cited in the application
L: citation for other reasons

&: member of the same patent family, corresponding document

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	16-04-1981	BAETENS

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