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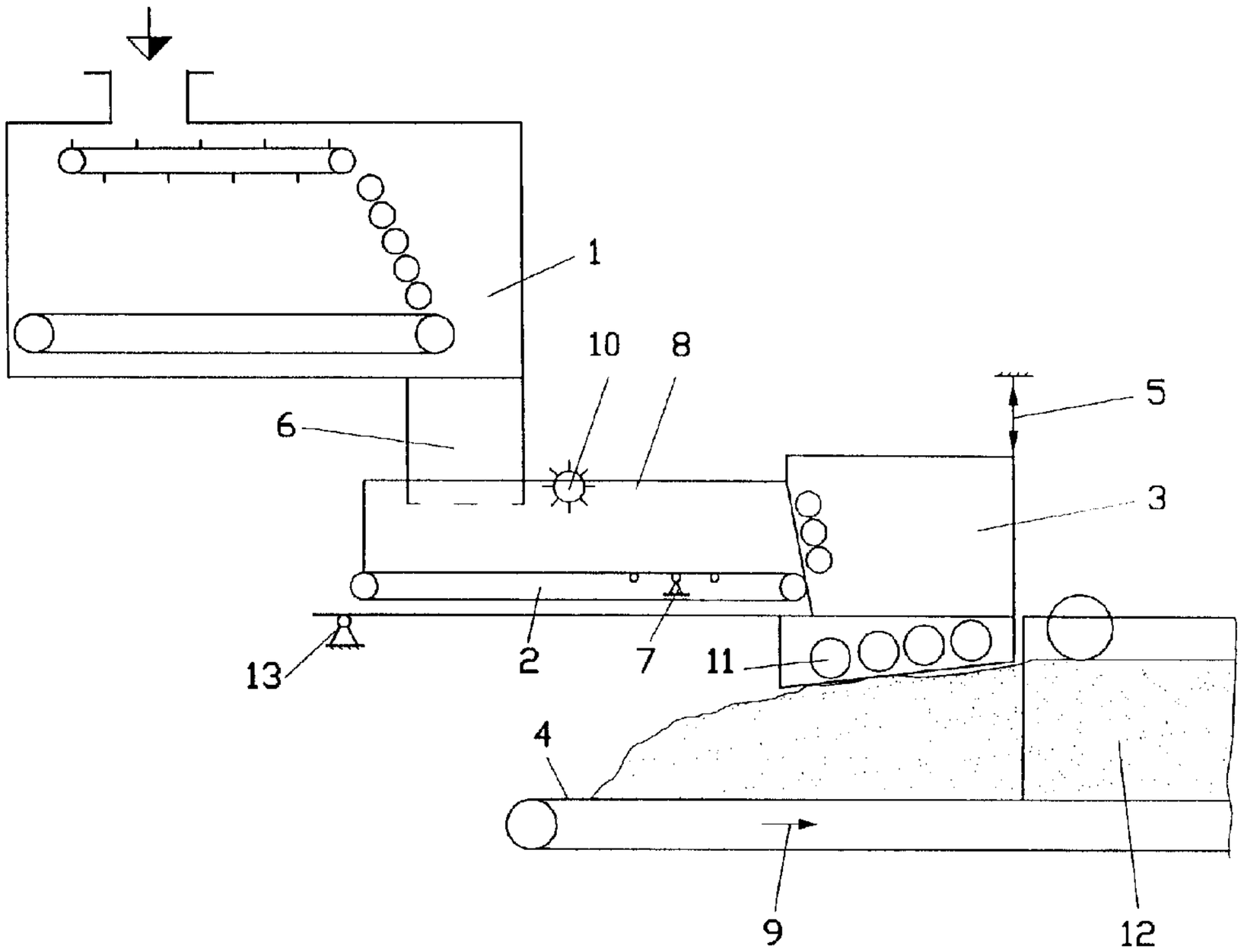
(54) Title: SCATTERING STATION FOR FIBRE PLATES



(57) Abrégé/Abstract:
The invention relates to a scattering station for fibre plates. Said station consists of a dosing bin (1) and a conveyor belt scale (2) with a scattering head (3) attached thereto. The height of the fibrous web (12) can be adjusted by simultaneously displacing the batching conveyor belt scale (2) and the scattering head (3). To this end, the batching conveyor belt scale (2) and the scattering head (3) are mounted on a mutual pivot bearing (13). The height of the scattering head (3) can be adjusted in relation to the moulding strap by means of a lifting device (5).

Abstract

The invention relates to a spreading station for fiber panels, which consists of a dosing hopper (1) and a conveyor or transport belt scale (2) with a spreading head (3) secured thereto, in connection with which the height of the fiber fleece (12) is adjustable by a common pivoting displacement of the dosing belt scale (2) with the spreading head (3). For this purpose, the dosing belt scale (2) and the spreading head (3) are supported on a common rotation bearing (13), and the spreading head (3) is adjustable in height relative to the forming belt (4) by means of a stroke apparatus (5).

LITERAL TRANSLATION OF PCT INTERNATIONAL APPLICATION
PCT/EP00/03278 AS FILED ON APRIL 12, 2000

Scattering Station for Fiber Plates

The invention relates to a spreading station for fiber panels according to the preamble of the patent claim 1.

Medium density fiberboard panels (MDF = medium density fiberboard), high density fiberboard panels (HDF = high density fiberboard), and fiber insulation panels are wood material panels of fibrous material. These fiber panels are produced in thicknesses from 1.6 to 40 mm and in a density range from approx. 350 to 1000 kg/m³, and are preferably used in the furniture industry and in interior finish construction. The fiber panels distinguish themselves from the chip panel by their uniform fiber or grain, smooth surface, and closed edge surface. Due to the production of the fiber panel from relatively thin wood fibers, during the spreading process a very voluminous fiber mat or fleece results, of which the spread height amounts to about the 20- or 40-fold multiple of the finished panel. For this purpose, fleece heights of 6 to 160 cm must be spread, which place high demands on the spreading station already for handling the volume. Especially, it is difficult to spread mats or fleeces for panels with different thicknesses and widths with such a spreading station.

Such a spreading station for MDF panels is known from the "Taschenbuch der Spanplattentechik" (Pocket Handbook of the Chip

Panel Technology), 3 Edition, by Deppe and Ernst, Tuebingen 1991, page 272. Therein, the glued wood fibers removed from a material storage hopper are delivered through a discharge front to a spreading head with spiked rollers. The spiked rollers are arranged one behind another in the transport direction and tilted or inclined relative to a horizontal line, whereby the last roller in the transport direction is secured at a maximum spreading height. Due to the loosening of the spread fibers, a voluminous fiber fleece or mat results, of which the surface is very uneven and the spreading height is relatively inexact. For that reason, an equalizing roller is installed as a distributing element at the end of the spreading head, whereby this equalizing roller is adjustable in its height to a prescribed fleece thickness. In this context, the excess combed-off fibers are sucked off and again delivered to the fiber circuit flow. Since bonding processes have already initiated in the sucked-off glued fibers due to the lost time, and since the fibers are dried due to the air transport, this has a disadvantageous effect on the panel quality, especially in connection with larger equalizing quantities.

It is therefore the object of the invention to improve a spreading station of the above named type so that the spreading is carried out so exactly, that a material return flow is no longer necessary.

This object is achieved by the invention recited in the patent claim 1. Further details and advantageous example embodiments of the invention are recited in the dependent claims.

The invention has the advantage, that due to the height-adjustable spreading head, the spreading rollers or at least one of the spreading rollers works as a distributing element, which equalizes the fibers in the spreading area by means of return-combing, so that no premature bonding or drying processes will arise through a return transport.

The invention also has the advantage that a very large height spreading range of approx. 6 to 160 cm can be carried out with one spreading station, by means of the pivoting displacement of the metering or dosing belt with the spreading head, in a simple manner using simple means.

Moreover, the invention has the advantage that the fall height of the fibers in the spreading apparatus does not change, so that the fiber density remains the same, due to the uniform height adjustment or change of the transport apparatus and the spreading apparatus relative to the forming belt.

A particular embodiment of the invention has the advantage that the fiber quantity that is delivered to the spreading rollers can be very exactly prescribed by means of the upstream-arranged dosing or metering belt, so that the required fiber quantity is

always available in the spreading head, in order to achieve an exact spreading and a small equalizing.

In a further particular embodiment of the invention with equalizing means on the metering or dosing belt, a constant volume quantity is introducible into the spreading head in an advantageous manner, whereby a very exact uniform spreading is made possible.

In a further advantageous embodiment, a gravimetric metering or dosing of the fiber quantity to be spread is achieved by means of a belt scale, whereby a very homogeneous spreading and uniform characteristics of the finished panels are made possible. Due to the simultaneous spreading and equalizing by the pivotable spreading head, simultaneously a pre-compression of the fiber fleece is also achieved in an advantageous manner, whereby a subsequent pre-compressing can be omitted, or at least can be carried out with only a small compressing effect.

In a further particular embodiment with an adjustable lateral side boundary, the spreading of different widths of panels is advantageously also possible, whereby the outside edges are exactly spreadable, without requiring an after-treatment or post-processing of the fiber fleece edges.

The invention will be described in greater detail in connection with an example embodiment, which is illustrated in the drawing.

The drawing schematically shows a forming station with at least one dosing or metering hopper 1, with at least one conveyor or transport apparatus 2 with a spreading head 3 secured thereto above a forming belt 4, whereby the transport apparatus 2 is rotatably supported on the side lying opposite the spreading head 3, and can be adjusted in height by means of a stroke apparatus 5.

The forming station is preferably useable for production of MDF panels and HDF panels, so that glued wood fibers are continuously discharged over a prescribed width out of the dosing hopper 1. The wood fibers are discharged out of a discharge opening 6 onto a transport apparatus 2 arranged thereunder, which can be embodied as a dosing belt or dosing belt scale. In connection with a dosing belt scale, a gravimetric scale or weighing device 7 is integrated in the transport apparatus 2. By means of the weighing device 7, the transport rate of the transport apparatus 2 is controllable as mass per time. Thereby, depending on the desired panel thickness, width, or density, a fiber quantity that is determinable therefor can be constantly supplied to a following spreading apparatus 3. At its outer edges, the dosing belt scale 2 has boundary walls 8, which correspond to the maximum spreading height. However, the height of the boundary walls 8 can also be selected higher or lower, depending on whether the belt speed is higher or lower than the forming belt speed.

The transport apparatus is embodied as a dosing belt scale 2, and transports the glued wood fibers in the desired fleece width to

the spreading apparatus 3. Insofar as various different panel widths are to be produced with the spreading station, the boundary walls 8 are embodied correspondingly in a width-adjustable manner. A height-adjustable equalizing element 10 in the form of a roller, a screw conveyor or comparable equalizing elements is provided above the dosing belt scale 2, in front of or before the weighing device 7 in the transport direction 9. In this equalizing element 10, a height equalization is carried out over the entire transport width.

A spreading apparatus 3, which is rigidly connected with the dosing belt scale 2, is provided on the side of the dosing belt scale 2 opposite the discharge location 6. The spreading apparatus 3 is embodied as a spreading head, which can have various different types of rollers, in order to spread the wood fibers onto a forming belt 4 arranged thereunder. The wood fibers may, however, also be spread by a distributing rake apparatus arranged on the dosing belt scale 2, or a compartmentalized chute. In this context, a compartmentalized chute consists of plural guide plates arranged parallel to the transport direction 9, whereby these guide plates divide the transport flow into plural parallel partial flows, and the spreading width is adjustable by a sliding or pivoting displacement of the guide plates.

The illustrated spreading head 3 consists of plural spreading or equalizing rollers 11 arranged one after another, and which are arranged crosswise or transversely relative to the transport direction 9, and which thoroughly intermix the material fibers

and spread the material fibers as homogeneously as possible in the desired height onto the forming belt 4. Since the intermixed fibers in the spreading of HDF and MDF panels comprise large air proportions, it is necessary to spread a fiber fleece 12 onto the forming belt 4, which fiber fleece 12 has at least the 20- to 40-fold multiple of the provided panel thickness. Such a large spreading height is reducible in that the spreading rollers 11 are arranged as adjustable distributing elements on or in the fiber fleece 12 in such a manner so that they press the fibers downwardly to the forming belt and already thereby a compressing effect is achieved.

However, in order to be able to spread panels of 1.6 to 40 mm thickness with spreading heights of 6 to 160 cm in a simple manner in a spreading station, the dosing belt scale 2 is rotatably supported on one side, and is pivotable about this rotation point by means of a stroke apparatus 5. For that purpose, the dosing belt scale 2 is rotatably supported in the area of the fiber discharge 6 by means of a rotation bearing 13 relative to a locationally-fixed part. The bearing element 13 may also be provided further toward the transport direction 9, whereby, however, the provided spreading height differences of 6 to 160 cm are no longer adjustably settable with comparatively small tilting displacement angles.

A stroke apparatus 5, which is secured on the one hand to the spreading apparatus 3 and on the other hand to a locationally-fixed part, is provided on the side opposite the rotational

bearing 13 in the transport direction 9. By means of this stroke apparatus 5, the spreading head 3 is adjustable in height in a simple manner over a large range, without requiring that the transport apparatus 2 must therefore additionally be adapted in height. The spreading head 3 can also be secured in an articulated manner to the transport apparatus 2, so that the angle of the spreading head 3 relative to the forming belt 4 during the stroke process is controllable so that it remains unchanged. The stroke apparatus 5 can also be arranged on the transport apparatus 2 or otherwise closer to the rotation point 13, as long as this is permitted by the structural requirements.

In a further embodiment, the height relative to the forming belt 4 can also be adjusted horizontally and parallel to the forming belt 4 by means of a further stroke apparatus. Then, one stroke apparatus can engage onto the transport apparatus 2 and the other stroke apparatus can engage onto the spreading apparatus 3, and both apparatus can be adjusted synchronously in height. Thereby, the fall height in the spreading apparatus is also not changed.

Patent Claims

1. Spreading station for fiber panels, which includes at least one dosing hopper and at least one spreading apparatus, by which the glued fibers are spreadable onto a forming belt, whereby the height of the spread fiber fleece is equalized by at least one height-adjustable distributing element, characterized in that a transport apparatus (2) with a spreading apparatus (3) secured thereto is provided after the dosing hopper (1), wherein the transport apparatus and the spreading apparatus are adjustable in common in height relative to the forming belt (4).

2. Spreading station according to claim 1, characterized in that the transport apparatus (2) with the spreading apparatus (3) secured thereto are pivotably supported relative to the horizontal by means of a rotation bearing (13), whereby the spreading apparatus (3) with the distributing elements (11) arranged therein is adjustable in common in height relative to the forming belt (4) by means of the pivoting.

3. Spreading station according to claim 1 or 2, characterized in that the rotation bearing (13) is arranged between the transport apparatus (2) and a locationally fixed part in the area of the material discharge (6) out of the dosing hopper (1).

4. Spreading station according to one of the preceding claims, characterized in that a stroke apparatus (5) is provided for the pivoting, and the transport apparatus (2) and the spreading apparatus (3) are vertically adjustable by the stroke apparatus.

5. Spreading station according to one of the preceding claims, characterized in that the stroke apparatus (5) is arranged on the transport (2) and/or spreading apparatus (3) in such a manner so that the height of the spreading apparatus (3) relative to the forming belt (4) is adjustable in a range from approx. 6 to 200 cm.

6. Spreading station according to one of the preceding claims, characterized in that the transport apparatus (2) is embodied as a dosing belt or dosing belt scale.

7. Spreading station according to one of the preceding claims, characterized in that boundary walls (8) are provided on the transport apparatus (2) and the width of the transported fibers is adjustable by the boundary walls.

8. Spreading station according to one of the preceding claims, characterized in that a vertically adjustable equalizing roller (10), screw conveyor, or comparable equalizing elements are arranged above the transport apparatus (2), and the transported fibers are uniformalized thereby.

9. Spreading station according to one of the preceding claims, characterized in that the spreading apparatus (3) is embodied as a roll, roller, screw conveyor or rake spreading head, or as a compartmentalized chute.

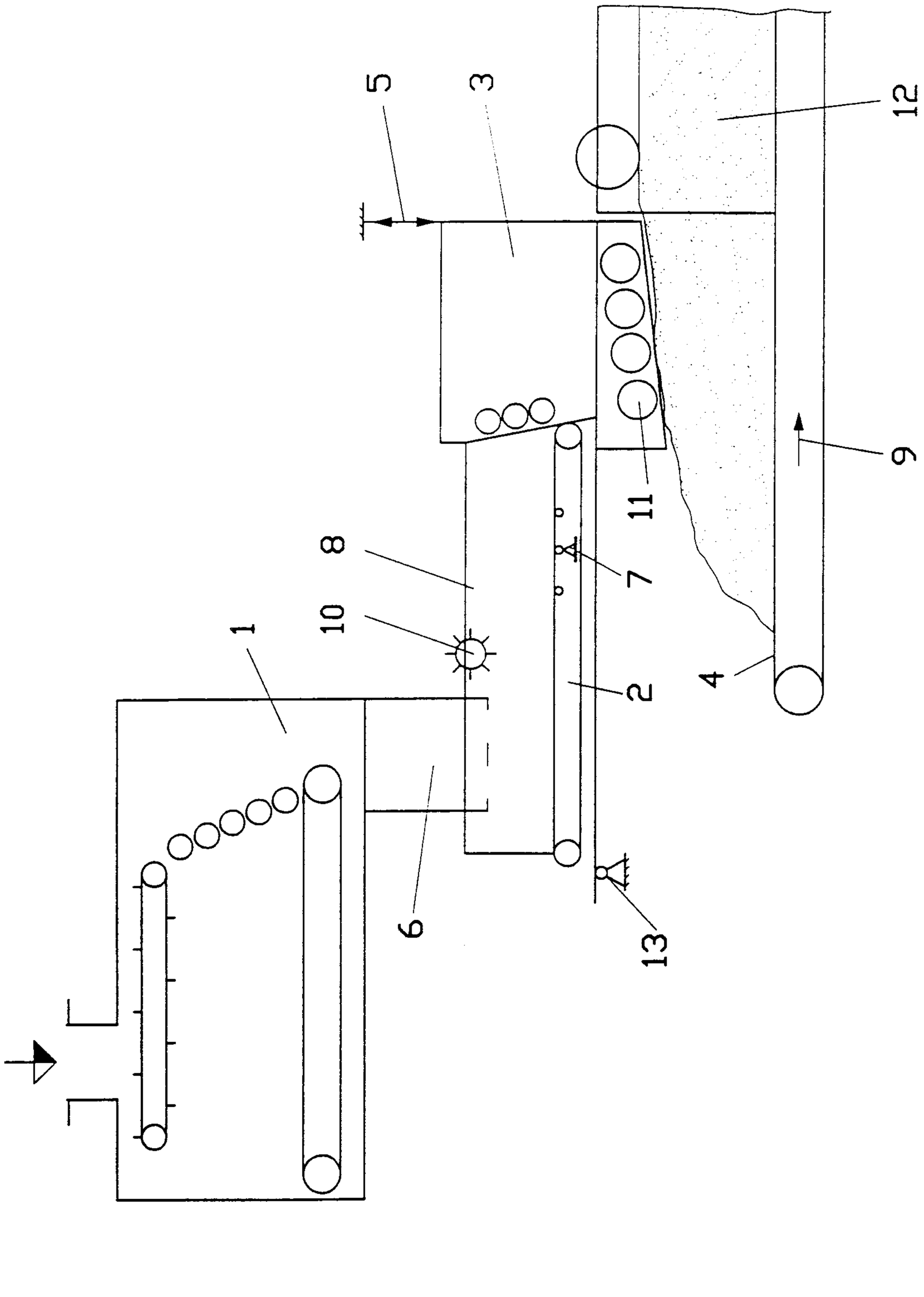
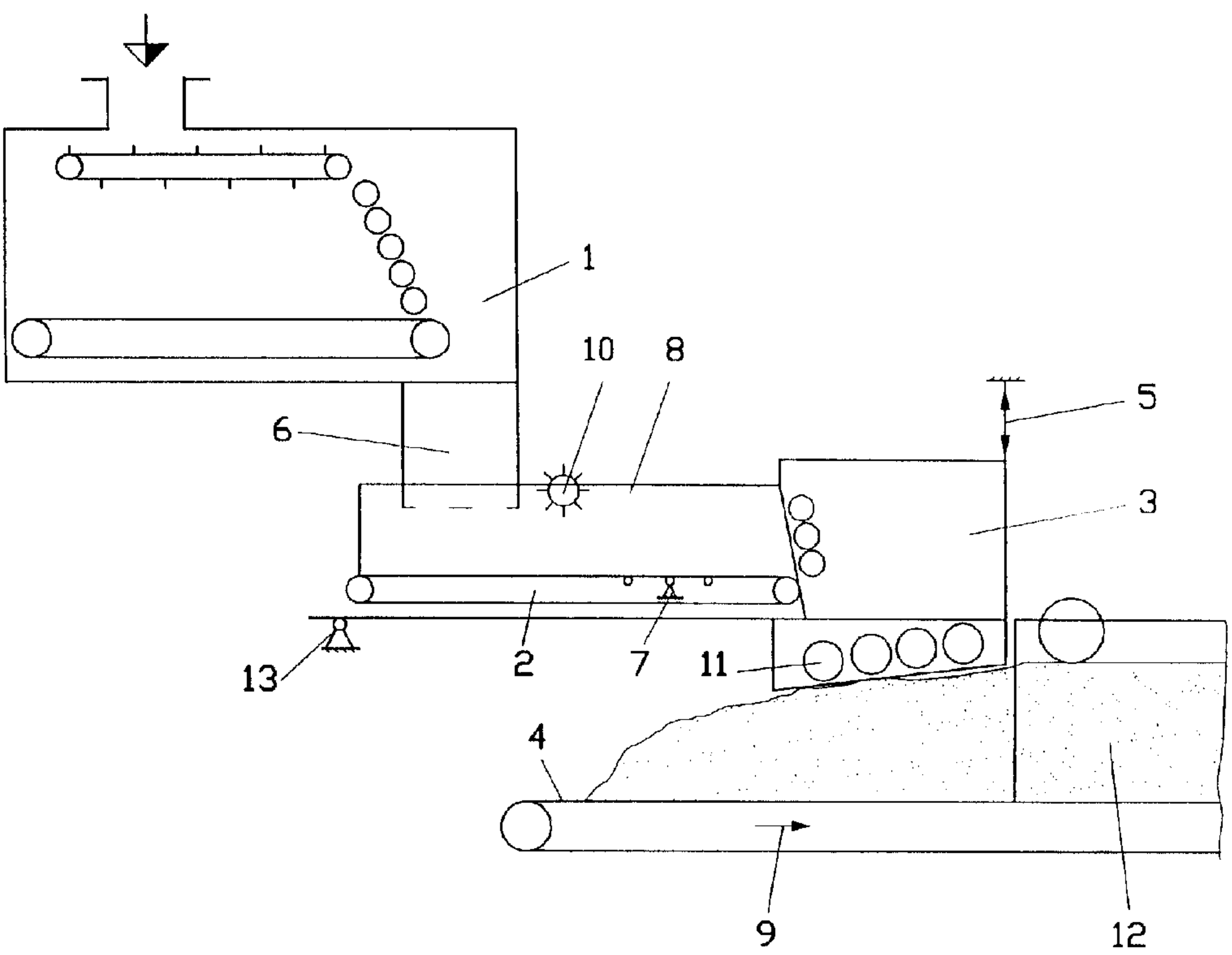


Fig. 1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