

# INTERNATIONAL STANDARD

**ISO  
15644**

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## **Road construction and maintenance equipment — Chippings spreaders — Terminology and commercial specifications**

*Équipement pour la construction et l'entretien des routes —  
Gravillonneuses — Terminologie et spécifications commerciales*

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## Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 15644 was prepared by Technical Committee ISO/TC 195, *Building construction machinery and equipment*.

## Introduction

This International Standard deals with chippings spreaders used in road construction and surface coating.

A chippings spreader is a machine used to spread a layer of chippings on the pavement at a predetermined rate.

This International Standard describes the performance characteristics and methods of operation of chippings spreaders and their components. It also provides their definitions and technical characteristics. It includes figures explaining the principles of machine operation and showing the main dimensions related to the machine's performance.

# Road construction and maintenance equipment — Chippings spreaders — Terminology and commercial specifications

## 1 Scope

This International Standard establishes the terminology and determines the type of technical and commercial specifications for chippings spreaders.

This International Standard is applicable to chippings spreaders intended for road construction and surface coating.

## 2 Normative reference

The following normative document contains provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, this publication do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the normative document indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

EN 13020, *Road-surface treatment machines — Safety requirements*

## 3 Terms and definitions

For the purposes of this International Standard, the following terms and definitions apply.

### 3.1

#### **chippings spreader**

machine used to spread a layer of chippings on the pavement at a pre-determined rate

NOTE A chippings spreader may be defined by its operating principle. Three types of chippings spreaders may be identified: transported, self-propelled and pushed by tipper truck.

### 3.2

#### **transported chippings spreader**

machine equipped with chippings spreading device mounted on the rear of a truck or semi-trailer

NOTE The chippings spreading device can be provided with rollers [delivery, see Figure 2 a) or spreading, see Figure 3 a)]. Chippings may be distributed also from the dumping body bottom by gravity [Figure 3 b)].

### 3.3

#### **self-propelled chippings spreader**

self-propelled machine provided with delivery roller

cf. Figure 2 a)

### 3.4

#### **chippings spreader pushed by tipper truck**

machine equipped with its own travelling axle and attached to the rear axle of the pushing tipper truck

NOTE Delivery roller of the spreader is driven from its travelling axle.

### 3.5

#### **transport vehicle**

truck or tractor semi-trailer unit which carries all the components and provides movement of the chippings spreader during spreading and road transfers

### 3.6

#### **dumping body**

bin in form of a box for storage of chippings during operation and transport

NOTE The dumping body supplies the chippings spreading device with chippings. It may be equipped with either a scraper shield or conveyor (see Figure 1).

### 3.7

#### **partial partition of dumping body**

division wall added in order to improve the distribution of loads over the axle and reducing the load on the chippings spreading device

### 3.8

#### **chippings spreading device**

spreading unit mounted on the rear of a tipper truck, and which travels mainly in reverse during work

NOTE The chippings spreading device can be fixed in the place of a tailgate or rear gate of the dumping body. The design of the chippings spreader device is adapted to the vehicle.

### 3.9

#### **control station**

assembly which contains the control and adjustment equipment

NOTE 1 The control station of a transported chippings spreader is typically installed on a platform, which may be fixed or articulated. The controls fulfil the following functions: on-off control of chippings spreading, adjustment of flow blade with or without indicator, adjustment of spreading width, and adjustment of dumper tilt.

NOTE 2 The control station of a self-propelled chippings spreader contains the controls to move the vehicle forward, supply the storage hoppers and spread the chippings. The control station enables the operator to monitor spreading and usually contains: vehicle operation controls with speedometer and revolutions counter for each roller, the control to unhook the towed truck, conveyors, flow blade, bin gates or slanted blades and expandable hoppers.

### 3.10

#### **power plant**

assembly which consists of mechanical components (engine, drive train and driven axles) that contribute to accomplishing the drive function in order to move the chippings spreader during spreading and transfer

### 3.11

#### **feed system**

system designed to transport chippings from receiving hopper to spreading hopper

NOTE The receiving hopper receives the chippings discharged by a truck or semi-trailer. The truck of the semi-trailer is coupled to the chippings spreader by means of a rear-mounted tow hook. One or more conveyors may provide transfer of chippings from this hopper to the spreading hopper. The feed system (Figure 9) is composed of a receiving hopper to enable supply of conveyors, and the conveyors which transport the chippings from the receiving hopper to the spreading hopper.

**3.12****spreading hopper**

bin supplied by one or more conveyors, which spreads a defined quantity of chippings on the ground

cf. Figure 12

**NOTE** The spreading hopper may be equipped with one delivery roller for a fixed width hopper, or multiple rollers or expandable hoppers or moving hoppers. Each delivery roller (1) provided at the hopper base enables regulation of the chippings spreader flow. The roller speed may be automatically controlled by the travel speed of the chippings spreader. The passage of chippings may be regulated by opening the flow blade (2). A feeder (3) ensures a regular fall of chippings on the ground. The spreading width can be adjusted by bin gates or slanting blades (4) for a fixed width hopper, the position of the expandable hoppers and the operation of cut-off plates to vary the width of chippings supplied to the spread roller, thereby varying the width of chippings laid onto the road surface.

**3.13****dumping body tilt angle**

angle of tilt of a dumping body bottom in relation to the horizontal, taken along the longitudinal axis of the vehicle ( $\alpha$  in Figure 1)

**3.14****dumping body slope**

angle of a dumping body bottom in relation to the horizontal, taken along the transverse axis of the vehicle ( $\beta$  in Figure 1)

**3.15****rear overhang of dumping body**

distance between the tipping axis and the rear of the dumping body

cf. Figure 8

**3.16****clearance**

distance between the ground and the lowest part of a spreader, taken with the dumping body raised

cf. Figure 8

**4 Description of chippings spreader operation****4.1 Extraction or distribution of chippings from the dumper body bottom**

Extraction is undertaken by a roller or by a conveyor (Figure 2) and enables automatic control of the chippings flow by the forward movement speed of the vehicle.

Distribution is undertaken by a roller or by gravity (Figure 3). The flow of chippings does not depend on the feeder element, which requires a constant vehicle speed and a constant angle of inclination of the dumping body bottom.

For safety requirements for chippings spreaders, see EN 13020.



## 4.2 Adjustment of chippings flow

The adjustment of chippings flow per unit of width is illustrated in Figure 4. The flow blade (or register) enables adjustment of the thickness of the stream of chippings. Adjustment may be undertaken

- either by using a flow blade or a stop on the bin gates, or
- by adjusting the speed of the roller or conveyor.

## 4.3 Adjustment of spreading width

This adjustment may be undertaken either by the bin gates or by slanting blades (Figure 5).

## 4.4 Automatic control by vehicle speed

In order to obtain a constant proportion of chippings on the ground, the roller speed, or the conveyor speed, or the opening of the flow blade may be linked to the vehicle speed unless the latter is kept absolutely constant.

## 4.5 Diffuser

A simple diffuser (Figure 6) typically has the following forms:

- smooth or partitioned;
- flat or curved.

A diffuser with built-in or separate distributor (Figure 7) may be equipped on each side with a folding flap extension so that the spreading width will then be greater than the vehicle width.

# 5 Commercial specifications

## 5.1 Transported chippings spreader

### 5.1.1 Main assemblies

These shall be as shown in Figure 1:

- transporting vehicle;
- dumping body;
- chippings spreading device;
- control station;
- partial partition.

### 5.1.2 Dimensional characteristics

#### 5.1.2.1 In transport position

The dimensions shown in Figure 8 a) shall be specified:

- rear projection,  $l_1$  (mm);
- projection under the dumper,  $h_1$  (mm);
- rear overhang of dumper,  $l_2$  (mm);

- total overhang in transport,  $l_3$  (mm);
- clearance,  $h_2$  (mm);
- overall width,  $b_1$  (mm).

#### 5.1.2.2 In working position with dump truck raised to 40°

The dimensions shown in Figure 8 b) shall be specified:

- height of fall of chippings,  $h_3$  (m);
- height of dumper bottom,  $h_4$  (mm);
- total spreading width,  $b_2$  (mm).

#### 5.1.3 Mass characteristics

The following characteristics shall be given:

- chippings carrying capacity (kg);
- laden mass of chippings spreader (kg);
- kerb mass of chippings spreader (kg);
- laden mass of transporting vehicle (kg).

### 5.2 Self-propelled chippings spreader

#### 5.2.1 Main assemblies

These shall as shown in Figure 9:

- power plant;
- drive axle(s);
- receiving hopper;
- conveyor(s);
- spreading hopper(s);
- control station with or without cab;
- tow hook.

#### 5.2.2 Dimensional characteristics

The following dimensions shall be specified, as shown in Figures 10 and 11:

- overall length (mm);
- overall height (mm);
- clearance (mm);
- overall width (hoppers folded) (mm);

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- capacity of receiving hopper ( $\text{m}^3$ );
- capacity of spreading hopper ( $\text{m}^3$ );
- height of hook from the ground (mm);
- position of hook in relation to the rear edge of the receiving hopper (mm);
- height of rear edge of receiving hopper from the ground (mm);
- diameter of tow hook hole (mm);
- height of tow bar of towed truck (mm);
- position of dumping body outlet in relation to the tow bolt with dumping body horizontal (mm);
- position of dumping body outlet in relation to the coupling bolt with dumping body at  $40^\circ$  (mm);
- height of dumping body outlet loaded, with dumping body horizontal (mm);
- height of dumping body outlet loaded, with dumping body at  $40^\circ$  (mm);
- diameter of truck tow bar (mm).

### 5.2.3 Mass characteristics

The following characteristics shall be given:

- total laden mass (kg);
- kerb mass (kg).

## 5.3 Chippings spreader pushed by tipper truck

### 5.3.1 Main assemblies

These shall be as shown in Figure 13:

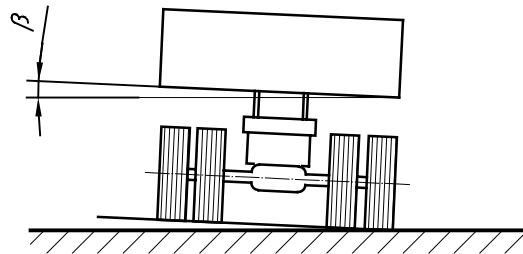
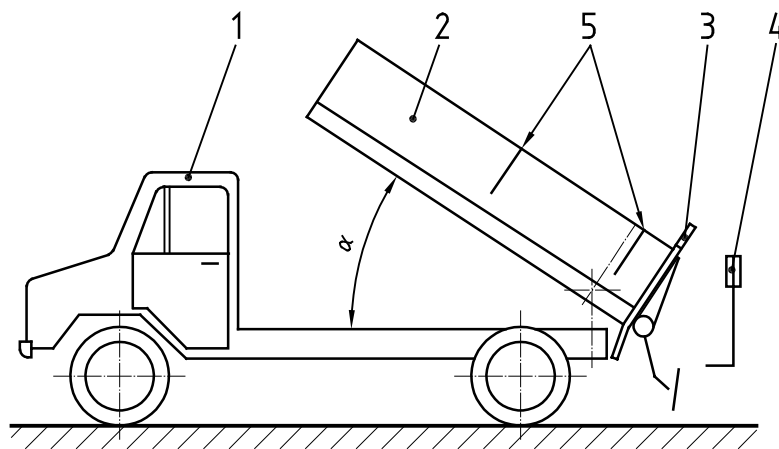
- box;
- reversible gearbox driven by the spreader wheels;
- delivery roller;
- travelling wheels;
- push beams with flanged heads for fitting to the rims of the rear truck wheels;
- hand levers to adjust the thickness of spreading chippings;
- working platform.

### 5.3.2 Technical characteristics

The following characteristics shall be given, as shown in Figure 13:

- width of spread,  $b$  (mm);
- capacity of box ( $\text{dm}^3$ );
- kerb mass (kg);
- wheels (number, dimensions);
- diameter of the push beam flanged head,  $d$  (mm);

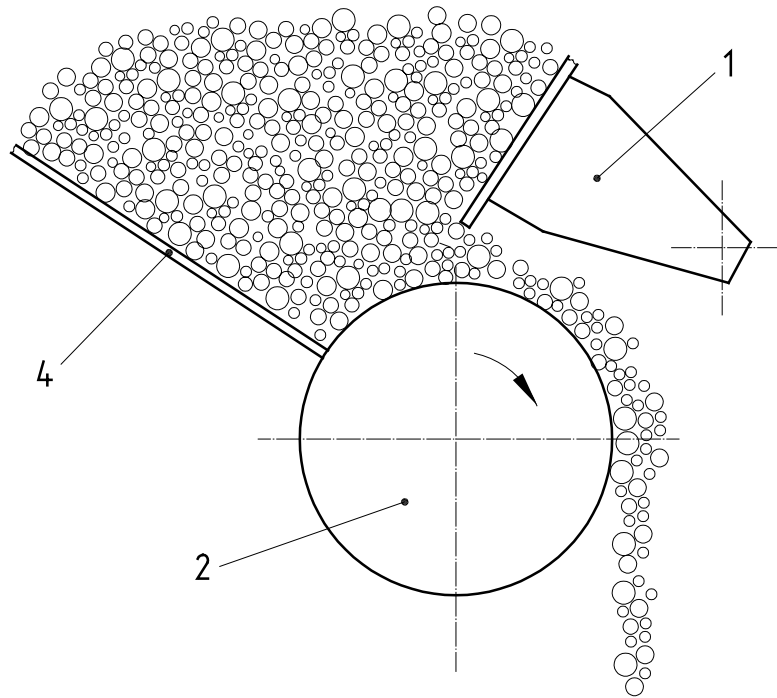
- overall dimensions:
  - max. length,  $l_1$  (mm),
  - width,  $b_1$  (mm),
  - height,  $h_1$  (mm);
- track (to centreline of wheels),  $a$  (mm);
- length of box,  $l_2$  (mm);
- height of box,  $h_2$  (mm);
- length of working platform,  $l_3$  (mm);
- min. distance between a box and axles of flanged heads,  $e$  (mm);
- pitch of fixing of flanged heads on push beams,  $p$  (mm);
- clearance,  $c$  (mm).



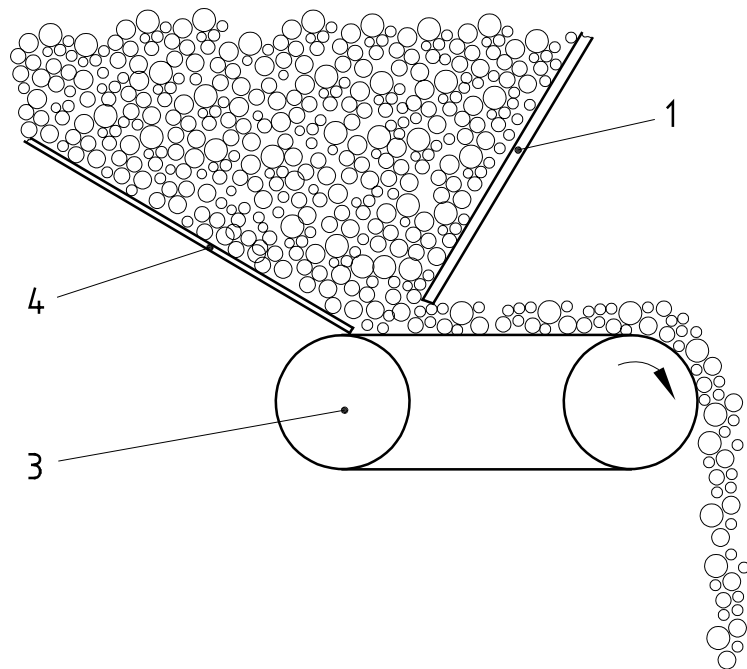
**Key**

- 1 Transporting vehicle
- 2 Dumping body
- 3 Chippings spreading device
- 4 Control station
- 5 Partial partition
- $\alpha$  Dumping body tilt angle (in degrees)
- $\beta$  Dumping body slope (in degrees)

**Figure 1 — Transported chippings spreader**



a) By delivery roller

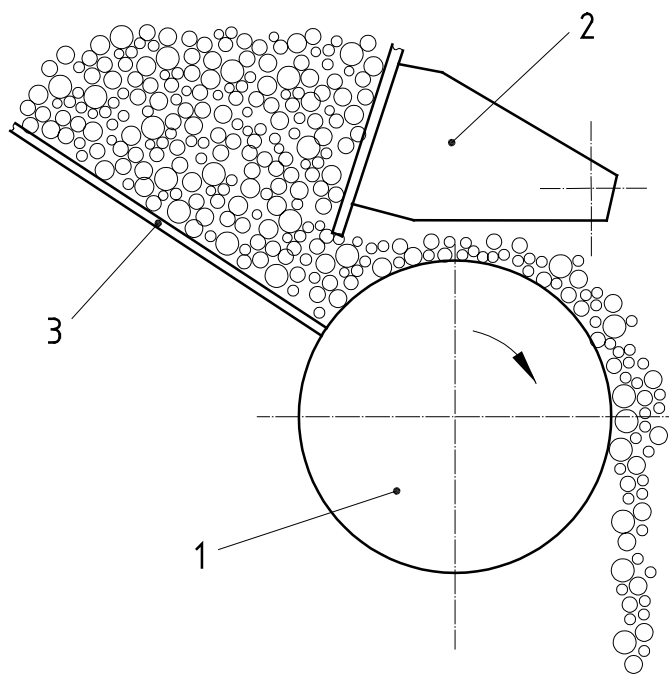


b) By conveyor feeder

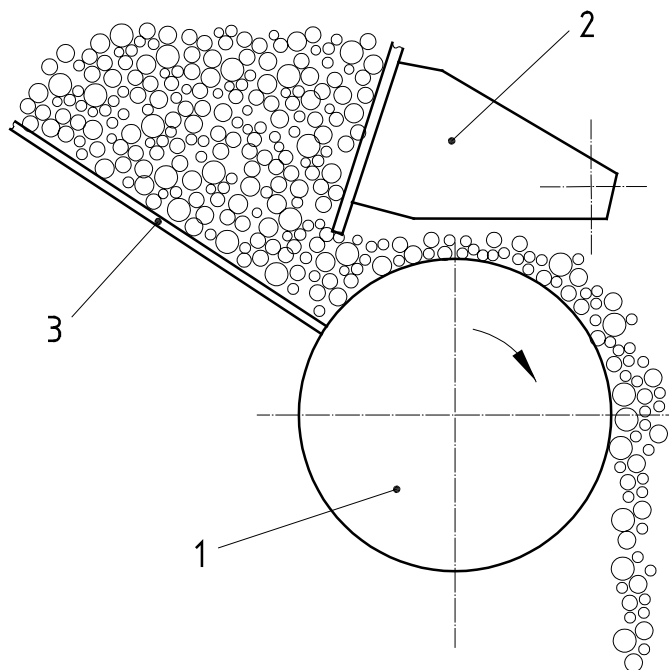
**Key**

- 1 Flow blade
- 2 Delivery roller
- 3 Conveyor feeder
- 4 Dumping body bottom

**Figure 2 — Chippings extraction from the dumping body bottom**



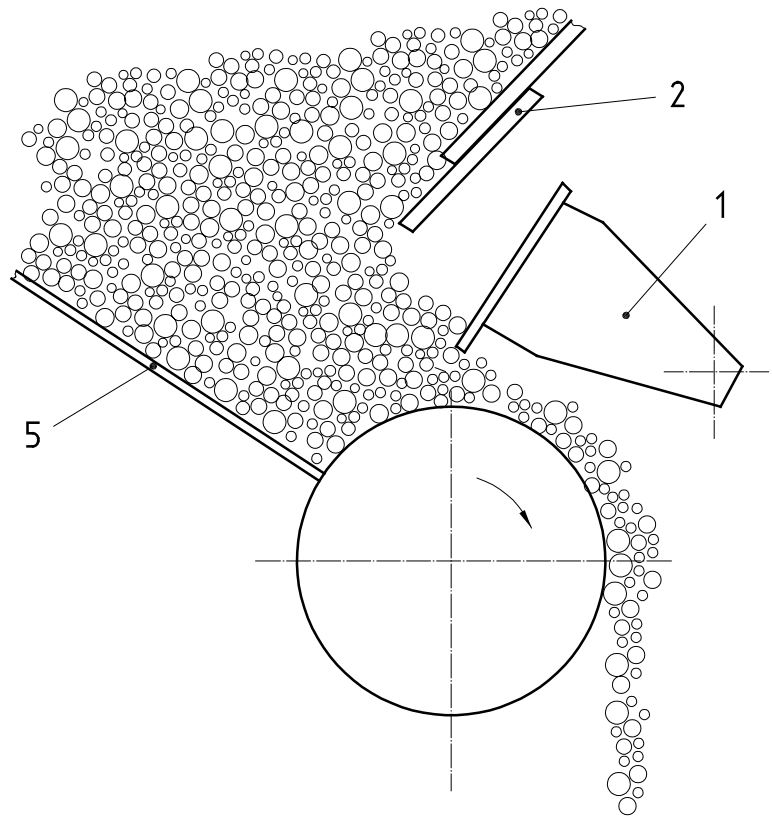
a) By spreading roller



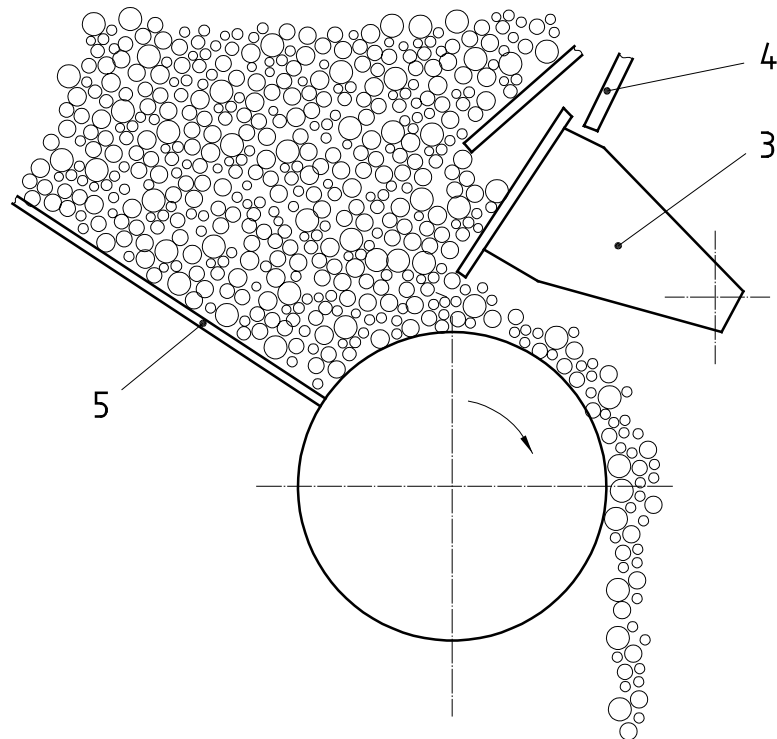
b) By gravity

- Key**
- 1 Spreading roller
  - 2 Flow blade
  - 3 Dumper bottom

**Figure 3 — Chippings distribution from the dumping body bottom**



a) By using separate components of a flow blade and bin gates



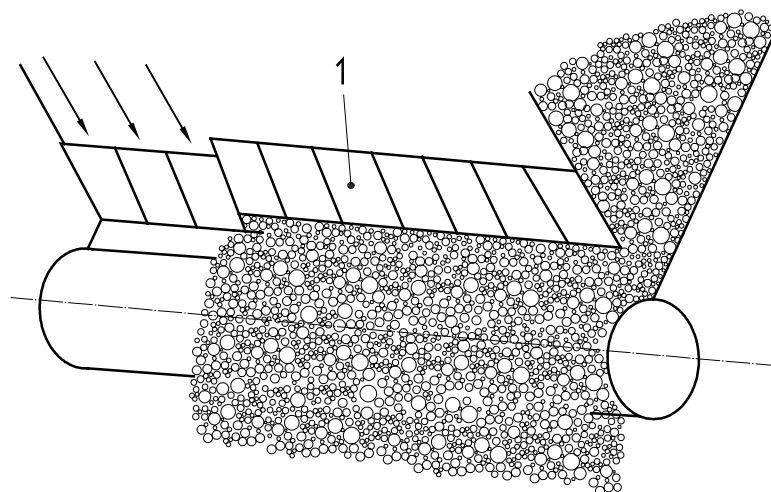
**Key**

- 1 Flow blade
- 2 Bin gates
- 3 Bin gates and flow blade
- 4 Flow stop
- 5 Dumping body bottom

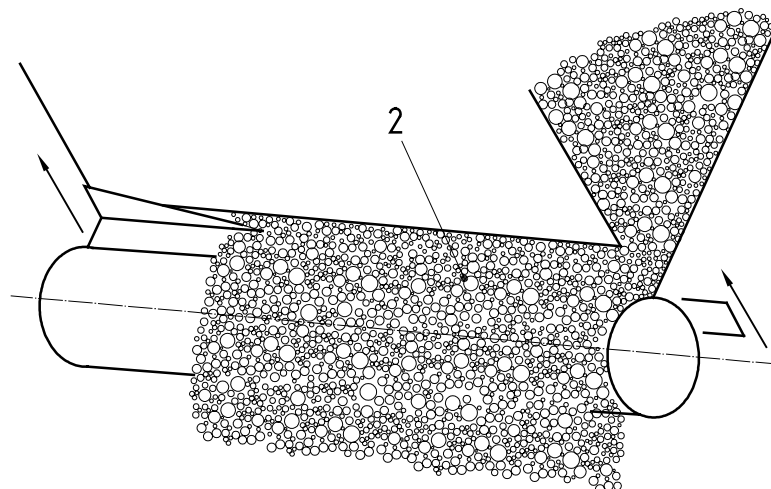
b) By using integrated components of bin gates and a flow blade

**Figure 4 — Adjustment of chippings flow per unit of width**





a) By using bin gates

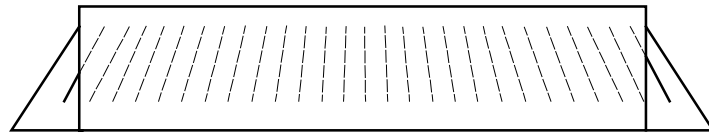


b) By using slanting blades

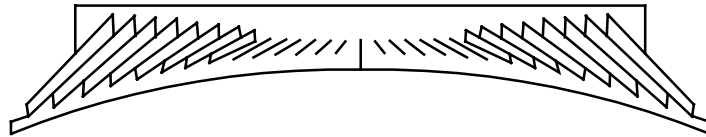
**Key**

- 1 Bin gates
- 2 Slanting blades

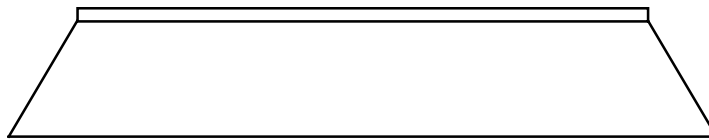
**Figure 5 — Adjustment of spreading width**



a) Partitioned flat



b) Partitioned curved

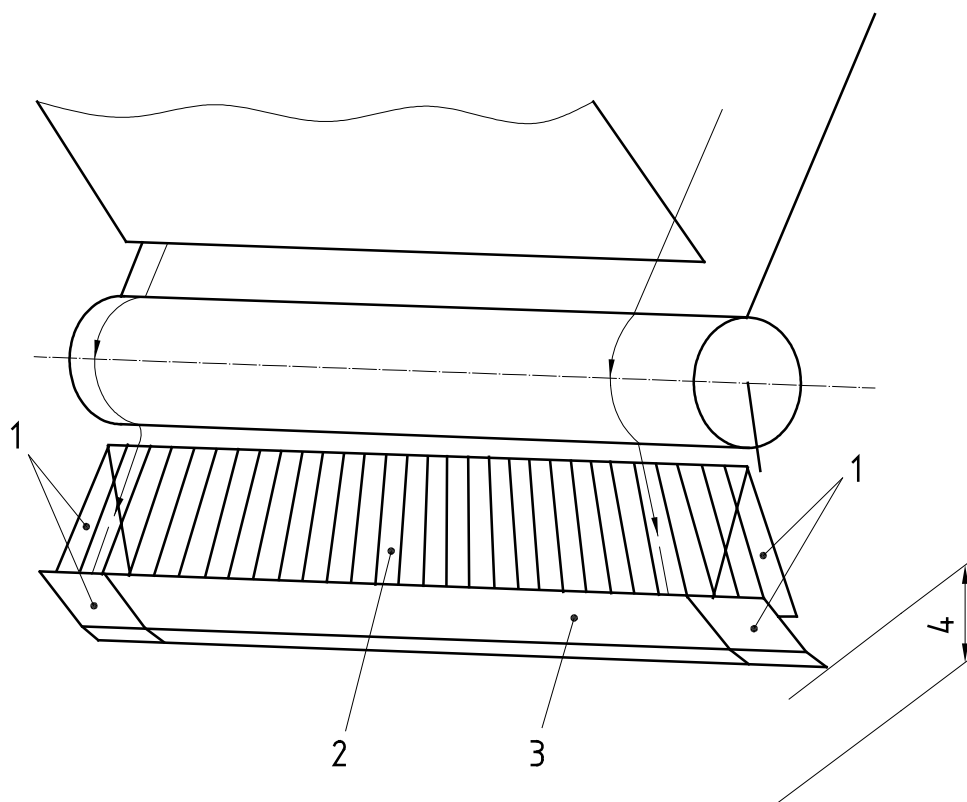


c) Smooth flat



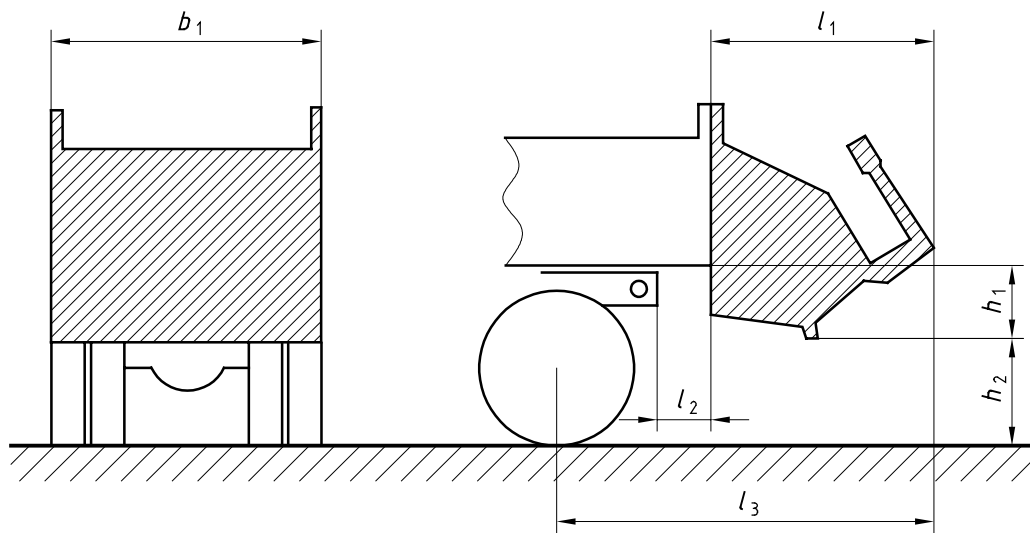
d) Smooth curved

Figure 6 — Types of simple diffuser

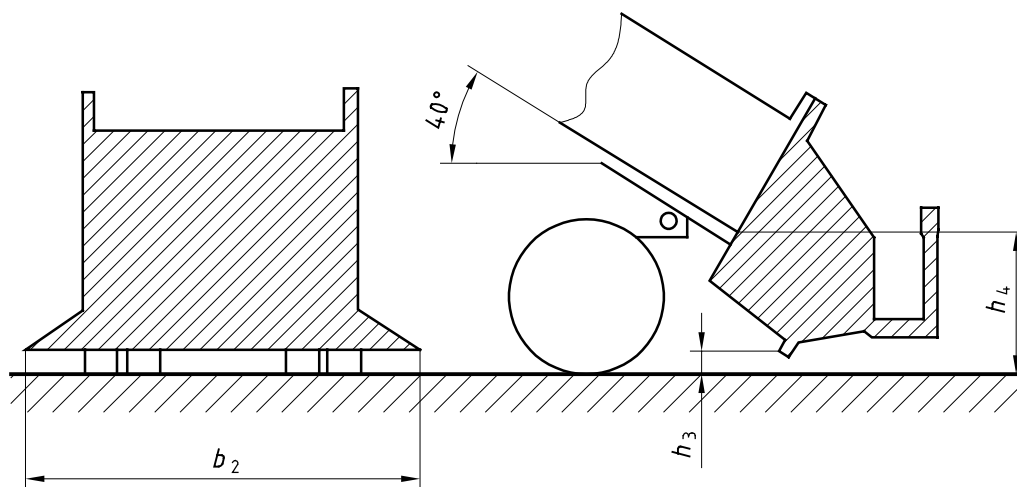


- Key**
- 1 Folding flaps
  - 2 Diffuser
  - 3 Feeder
  - 4 Height of fall

**Figure 7 — Diffuser with feeder**



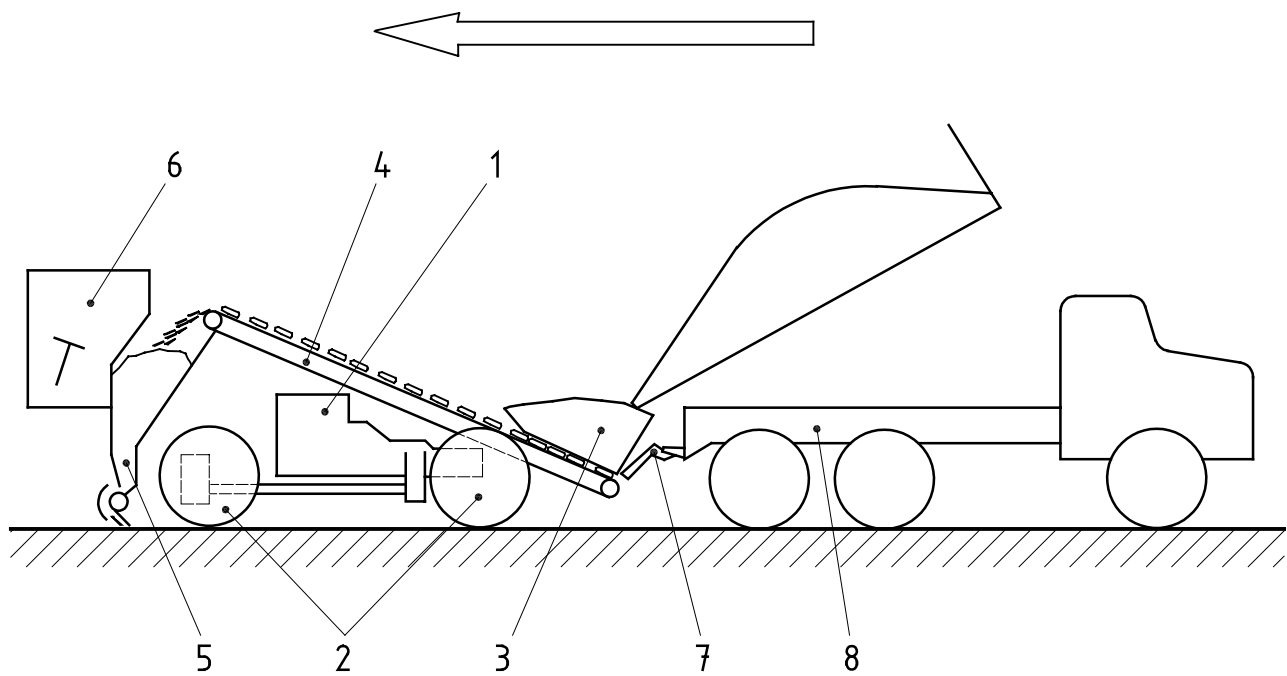
a) In transport position



b) In working position

- $b_1$  Overall width
- $b_2$  Total spreading width
- $h_1$  Projection under dumper
- $h_2$  Clearance
- $h_3$  Height of fall of chippings
- $h_4$  Height of dumper bottom
- $l_1$  Rear projection
- $l_2$  Rear overhang of dumper
- $l_3$  Total overhang

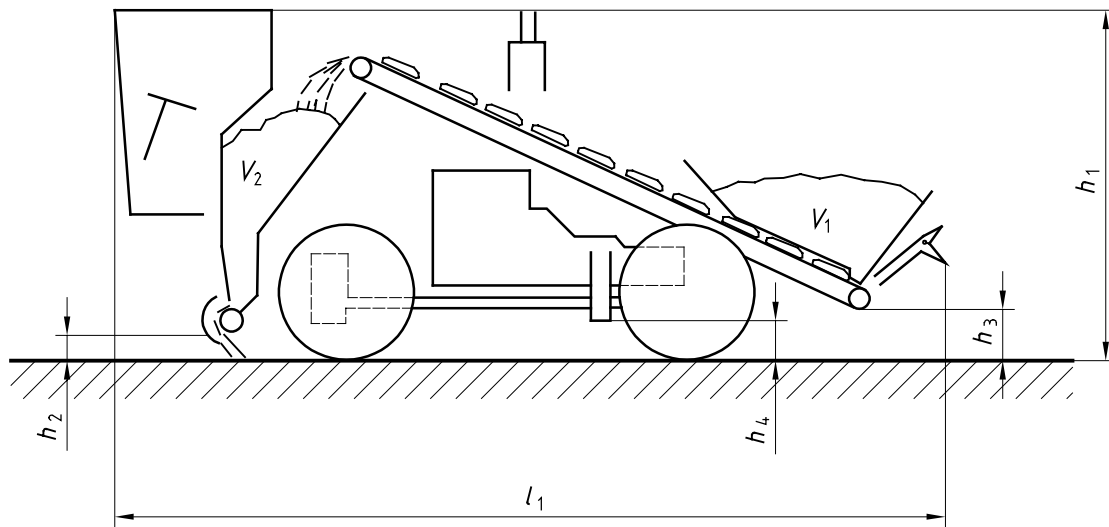
Figure 8 — Dimensional characteristics of a transported chippings spreader



**Key**

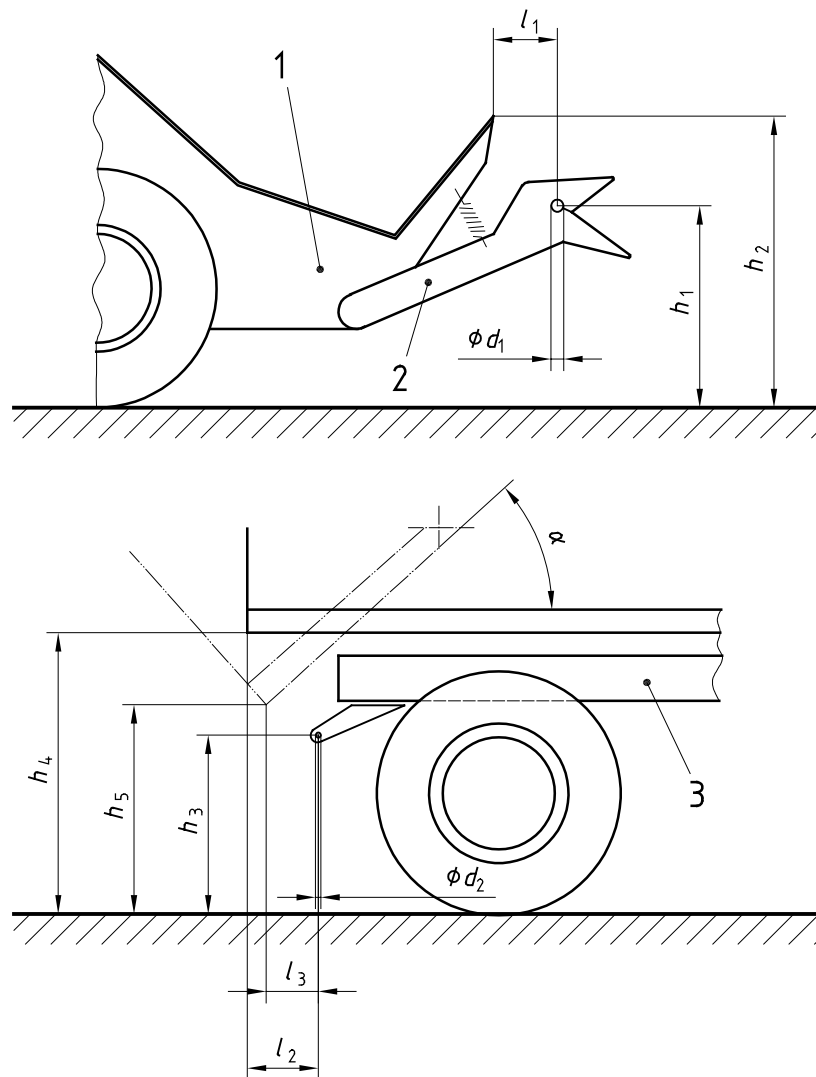
- 1 Power plant
- 2 Driven axle(s) 4 × 2 or 4 × 4
- 3 Receiving hopper
- 4 Conveyor(s)
- 5 Spreading hopper(s)
- 6 Control station
- 7 Tow hook
- 8 Towed dump truck

**Figure 9 — Self-propelled chippings spreader**



- $h_1$  Overall height
- $h_2$  Front clearance
- $h_4$  Mid clearance
- $h_3$  Rear clearance
- $l_1$  Overall length
- $V_1$  Capacity of receiving hopper
- $V_2$  Capacity of spreading hopper

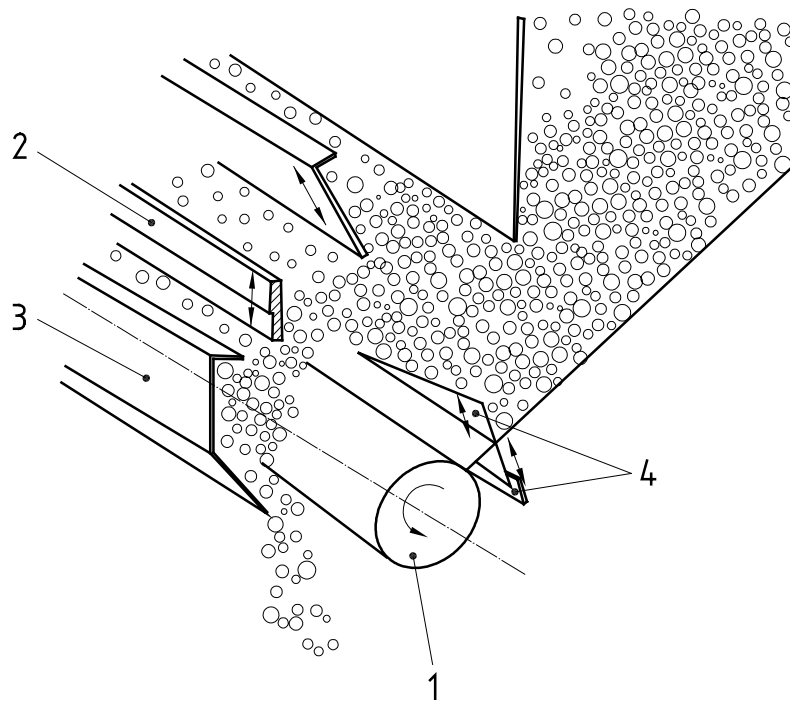
**Figure 10 — Overall dimensions of the self-propelled chippings spreader**



**Key**

- 1 Rear edge of receiving hopper
- 2 Attachment hook with flexible fitting
- 3 Truck towed by chippings spreader
- $d_1$  Diameter of tow hook hole
- $d_2$  Diameter of tow hook hole
- $h_1$  Height of hook from ground
- $h_2$  Height of rear edge of receiving hopper from ground
- $h_3$  Height of tow bar of towed trucks
- $h_4$  Height of dumper outlet, loaded — dumper horizontal
- $h_5$  Height of dumper outlet, loaded — dumper at  $40^\circ$
- $l_1$  Position of hook in relation to rear edge of receiving hopper
- $l_2$  Position of dumper outlet in relation to tow bolt — dumper horizontal
- $l_3$  Position of dumper outlet in relation to tow bolt — dumper at  $40^\circ$
- $\alpha$  Angle of dumper tipping, equal to  $40^\circ$

**Figure 11 — Towing hook dimensions and positioning**



**Key**

- 1 Delivery roller
- 2 Flow blade
- 3 Feeder
- 4 Bin gates or slanting blades

**Figure 12 — Spreading hopper**



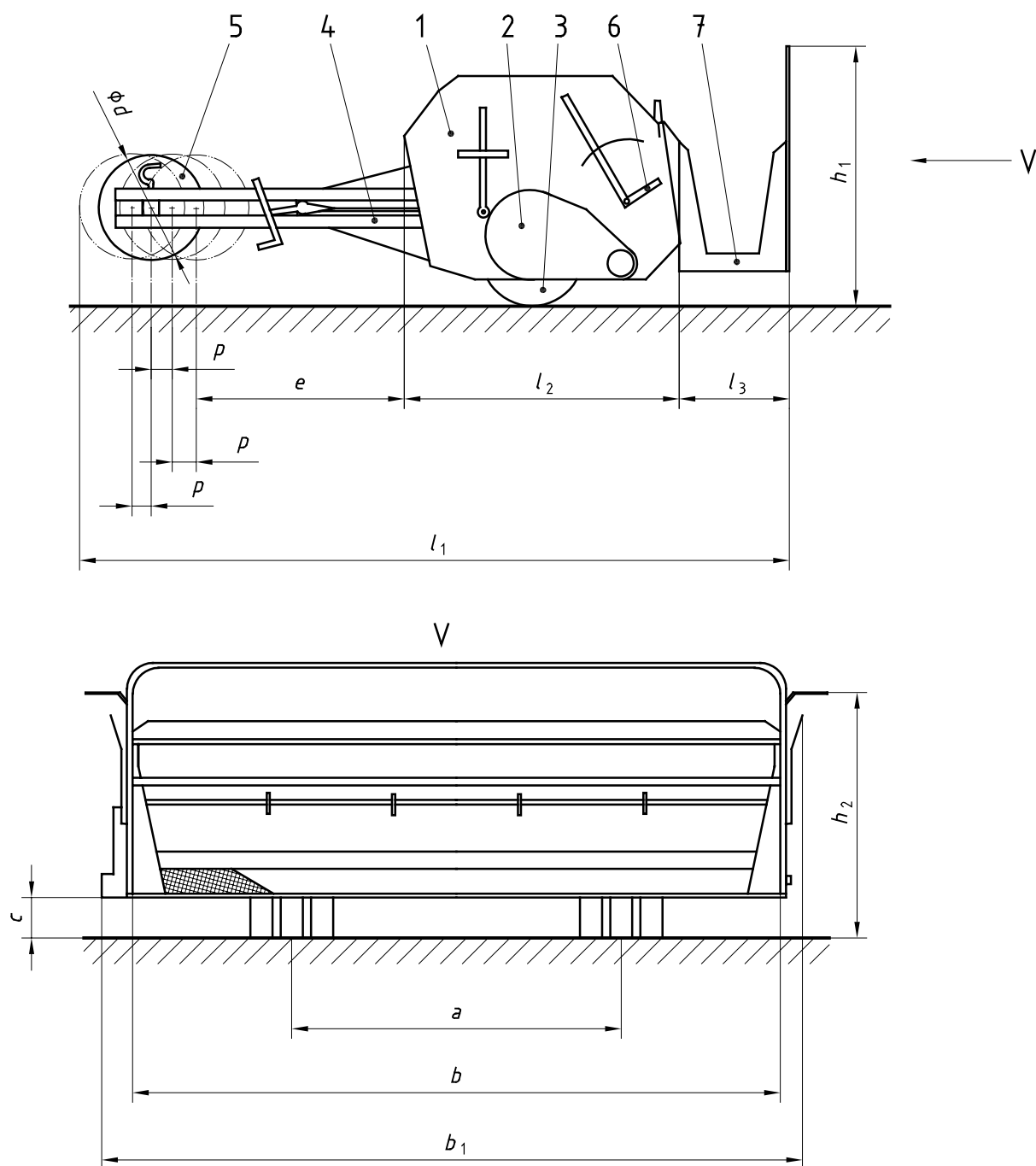


Figure 13 — Chipping spreader pushed by tipper truck

**Key**

1	Box
2	Reversible gear box driven by the spreader wheels
3	Travelling wheels
4	Push beams
5	Flanged heads for fitting to the rims of the rear truck wheels
6	Handlevers to adjust flow rate of spreading chips
7	Working platform
<i>a</i>	Track (to centreline of wheels)
<i>b</i>	Width of spread
<i>b</i> <sub>1</sub>	Width
<i>c</i>	Clearance
<i>d</i>	Diameter of push beam flanged head
<i>e</i>	Min. distance between a box and an axle of flanged heads
<i>h</i> <sub>1</sub>	Height
<i>h</i> <sub>2</sub>	Height of box
<i>l</i> <sub>1</sub>	Max. length
<i>l</i> <sub>2</sub>	Length of box
<i>l</i> <sub>3</sub>	Length of working platform
<i>p</i>	Pitch of fixing of flanged heads

**Figure 13 — Chipping spreader pushed by tipper truck**

