SIST

SLOVENSKI STANDARD
SIST EN 618:2003

01-maj-2003

Naprave in sistemi za kontinuirni transport - Varnostne zahteve in zahteve za elektromagnetno združljivost naprav, sistemov in opreme za kontinuirni transport sipkih materialov na pomičnih ogrodjih (razen naprav na nepomičnih ogrodjih)

Continuous handling equipment and systems - Safety and EMC requirements for equipment for mechanical handling of bulk materials except fixed belt conveyors

Stetigförderer und Systeme - Sicherheits- und EMV- Anforderungen an mechanische Fördereinrichtungen für Schüttgut ausgenommen ortsfeste Gurtförder

Equipements et systemes de manutention continue - Prescriptions de sécurité et de CEM pour les équipements de manutention mécanique des produits en vrac a l'exception des transporteurs fixes a courroie

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33.100.01	Elektromagnetna združljivost na splošno	Electromagnetic compatibility in general
53.040.10	Transporterji	Conveyors

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English version

Continuous handling equipment and systems - Safety and EMC requirements for equipment for mechanical handling of bulk materials except fixed belt conveyors

Equipements et systèmes de manutention continue - Prescriptions de sécurité et de CEM pour les équipements de manutention mécanique des produits en vrac à l'exception des transporteurs fixes à courroie

Stetigförderer und Systeme - Sicherheits- und EMV-Anforderungen an mechanische Fördereinrichtungen für Schüttgut ausgenommen ortsfeste Gurtförder

This European Standard was approved by CEN on 8 March 2001.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

Contents

Foreword

This document (EN 618:2002) has been prepared by Technical Committee CEN /TC 148, "Continuous handling equipment and systems", the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2002, and conflicting national standards shall be withdrawn at the latest by October 2002.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative annex ZA and ZB, which is an integral part of this document.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Within the framework of its programme of work, CEN/TC 148 requested the working group 3 ” Safety requirements for continuous mechanical handling equipment for bulk materials excluding fixed belt conveyors" to prepare the following standard :

EN 618, *Continuous handling equipment and systems - Safety and EMC requirements for equipment for mechanical handling of bulk materials except fixed belt conveyors.*

This standard forms part of a series of five standards the titles of which are given below :

EN 617, *Continuous handling equipment and systems - Safety and EMC requirements for equipment for the storage of bulk materials in silos, bunkers, bins and hoppers.*

EN 618, *Continuous handling equipment and systems – Safety EMC requirements for equipment for mechanical handling of bulk materials except fixed belt conveyors*

prEN 619, *Continuous handling equipment and systems - Safety and EMC requirements for equipment for mechanical handling of unit loads.*

EN 620, *Continuous handling equipment and systems - Safety and EMC requirements for fixed belt conveyors for bulk materials.*

EN 741, *Continuous handling equipment and systems - Safety requirements for systems and their components for pneumatic handling of bulk materials.*

The annex A is normative, and the annexes B, ZA and ZB are informative.

Introduction

This European standard is a "Type C" standard as defined in EN 1070.

The equipment concerned and the extent to which hazards are covered are indicated in the scope of this standard.

EN 617, EN 620 and EN 741 need to be considered for a complete continuous handling system (machine).

While producing this standard, it was assumed that :

— only suitably trained persons will operate the equipment ;

— all parts of the equipment without specific requirements in this standard are :

  — designed in accordance with the usual engineering practice and calculation codes (e.g. for mobile equipment FEM 2 131/2 132 or ISO 5049-1, ...) including all failure modes ;

  — made of materials of adequate strength and of quality for their intended purpose taking into account all failure modes using recognised design methods and appropriate safety factors ;

— harmful materials, such as asbestos, are not used as part of the machine ;

— components will be kept in good repair and working order in accordance with the manufacturer's instructions, to retain specified health and safety characteristics throughout its working life ;

— by design of the load bearing elements, a safe operation of the equipment is assured for loading ranging from zero to 100 % of the rated capacity ;

— negotiations occur between the manufacturer [1)] and the user concerning materials characteristics (see Note 1) and particular conditions for the use and places of use for the machinery related to health and safety ;

— the place of installation is adequately lit.

NOTE 1 For the description of bulk materials, reference can be made to documents FEM 2 581/2 582 and ISO 3435.

When provisions of this type C standard are different from those which are stated in type A or B standards the provisions of this type C standard take precedence over the provisions of other standards, for equipment that have been designed and built according to the provisions of this type C standard.

1) "Manufacturer" within the European Union is to be understood as intended in the Machinery Directive.

1 Scope

1.1 This standard deals with the technical requirements to minimise the risks due to the hazards listed in clause 4, which can arise during operation and maintenance of mechanical handling equipment defined in clauses 3.1 to 3.3 and which are designed for continuously conveying bulk materials from the loading point(s) to the unloading point(s).In general, it also applies to equipment which are built into machines or attached to machines. This standard deals with the technical requirements for EMC.

1.2 The standard does not apply to :

— continuous handling equipment and systems for open-cast lignite mining ;

— continuous handling equipment and systems for underground mining ;

— tunnel digging and excavating machines ;

— bulk material processing or classification machines such as grinders, crushers, screens ;

— fixed belt conveyors for bulk materials. These are covered by the standard EN 620:2002;

— fixed pneumatic handling equipment. These equipment and systems are covered by the standard EN 741 ;

— the interface between the machinery dealt with in this standard and the fixed belt or pneumatic conveyor.

1.3 This standard does not give the additional requirements for :

a) use in public areas or for the transportation of people ;

b) floating, dredging and ship mounted equipment ;

c) conveyors requiring a high level of cleanliness for hygiene reasons, e.g. in direct contact with foodstuffs or pharmaceuticals ;

d) transportation of the equipment ;

e) hazards caused by vibration ;

f) use in ambient air temperature below – 20 °C and above + 40 °C ;

g) the effects of wind on strength and stability ;

h) hazards resulting from handling specific hazardous materials, (e.g. Explosives, radiating material) ;

i) hazards resulting from contact with or inhalation of harmful fluids, gas, mists, fumes and dusts ;

j) biological and micro-biological (viral or bacterial) hazards ;

k) hazards due to heat radiation from the materials handled ;

l) hazards caused by operation in electromagnetic fields outside the range of EN 61000-6-2 ;

m) hazards caused by operation subject to special regulations (e.g. explosive atmospheres) ;

n) hazards caused by noise ;

o) hazards caused by the use of ionising radiation sources (e.g. measurement equipment) ;

p) hazards caused by hydraulic equipment ;

q) hazards caused by inadequate controls cabins lighting ;

r) the risk related to elevating of the control stations ;

s) hazards related to contact with or inhalation of harmful fluids, gases, mists, fums and dusts.

1.4 The safety requirements apply to equipment and systems placed on the market after the date of publication of this standard.

NOTE 1 The requirements of this standard can be used for comparable machines outside the scope of this standard with the same risks.

NOTE 2 Directive 94/9/EC concerning equipment and protective systems intended for use in potentially explosive atmospheres can be applicable to the type of machine or equipment covered by this European Standard. The present standard is not intended to provide means of complying with the essential health and safety requirements of Directive 94/9/EC.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 292-1:1991, *Safety of machinery - Basic concept - General principles for design - Part 1 : Basic terminology – Methodology.*

EN 292-2:1991, *Safety of machinery - Basic concept - General principles for design - Part 2 : Technical principles and specifications.*

EN 292-2/A1:1995, *Safety of machinery - Basic concept - General principles for design - Part2 : Technical principles and specifications.*

EN 294:1992, *Safety of machinery - Safety distances to prevent danger zones being reached by the upper limbs.*

EN 349:1993, *Safety of machinery - Minimum gaps to avoid crushing of parts of the human body*.

EN 418:1992, *Safety of machinery - Emergency stop equipment functional aspects - Principles for design.*

EN 563:1994, *Safety of machinery - Temperatures of touchable surfaces.*

EN 617, *Continuous handling equipment and systems – Safety and EMC requirements for storage of bulk materials in silos, bunkers, bins and hoppers.*

EN 620:2002, *Continuous handling equipment and systems – Safety and EMC requirements for fixed belt conveyors for bulk material.*

EN 741:2000, *Continuous handling equipment and systems – Safety requirements for systems and their components for pneumatic handling of bulk materials.*

EN 811:1996, *Safety of machinery - Safety distances to prevent danger zone being reached by the lower limbs.*

EN 953:1997, *Safety of machinery - General requirements for the design and construction of guards (fixed, movable).*

EN 954-1:1997, *Safety of machinery - Safety related parts of control systems - Part 1 : General principles for design.*

EN 1037:1995, *Safety of machinery - Prevention of unexpected start-up.*

EN 1070:1998, *Safety of machinery – Terminology.*

EN 1088:1995, *Safety of machinery - Interlocking devices associated with guards - Principles for design and selection.*

EN 1127-1:1997, *Safety of machinery - Fire and explosion - Part 1 : Explosion prevention and protection.*

EN 12150-1:2000, *Glass in building - Thermally toughened soda lime silicate safety glass - Part 1 : Definition and description*prEN 13586:1999, *Cranes – Access.*

EN 13202:2000, *Ergonomics of the thermal environment – Temperatures of touchable hot surfaces – Guidance for establishing surface temperature limit values in production standards with the aid of EN 563.*

EN 13586:1999, *Cranes. Access*

EN 26184-1:1991, *Explosion protection systems – Part 1 : Determination of explosion indices of combustibles dusts in air (ISO 6184-1:1985).*

EN 50081-1:1992, *Electromagnetic compatibility - Generic emission standard - Part 1 : Residential commercial and light industry.*

EN 60204-1:1997, *Safety of machinery - Electrical equipment of machines - Part 1 : Specification for requirements.*

prEN 60204-11:1998, *Safety of machinery - Electrical equipment of machines - Part 11 : General requirements for high voltage above 1 000 V a;c; or 1 500 V d.c. and not exceeding 36 kV.*

EN 60947-5-1:1991, *Low voltage switch gear and control gear - Part 5 : Control circuit devices and switching elements - Section 1 : Electromechanical control circuit devices.*

EN 60529:1991, *Degrees of protection provided by enclosures (IP code).*

EN 61000-6-2:1999, *Electromagnetic compatibilty (EMC) – Part 6-2 : Generic standards – Immunity for industrial environments (CEI 61000-6-2:1999)*

ISO 2148:1974, *Continuous handling equipment - Nomenclature - Bilingual edition.*

ISO 3435:1977, *Continuous mechanical handling equipment - Classification and symbolisation of bulk materials.*

ISO 3864:1984, *Safety colours and safety signs.*

ISO 5049-1:1994, *Mobile equipment for continuous handling of bulk materials – Part 1 : Rules for the design of steel structures.*

IEC 61241-1-2:1999, *Electrical apparatus for use in the presence of combustible dust - Part 1-2 : Electrical apparatus protected by enclosures - Selection, installation and maintenance.*

3 Terms and definitions

For the purposes of this standard, the terms and definitions stated in EN 1070 and ISO 2148 apply. Additional terms used in this standard are defined below. For other definitions on components of fixed belt conveyors, see EN 620:2002.

3.1
fixed equipment

3.1.1
scraper conveyor / drag bar feeder :
conveyor for loose bulk materials with as driving medium one or more endless chains equipped with scraper bars pushing the material in an open trough shaped casing (see Figure 1)

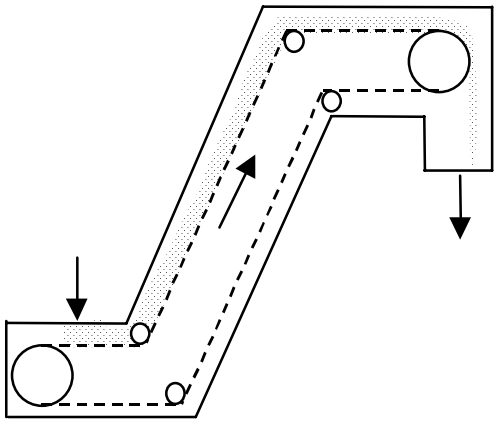

Figure 1

3.1.2
"en-masse" conveyor
conveyor for loose bulk materials with a chain as the driving medium having attached flights or scraper flights moving the material "en masse" in an enclosing trough (see Figure 2)

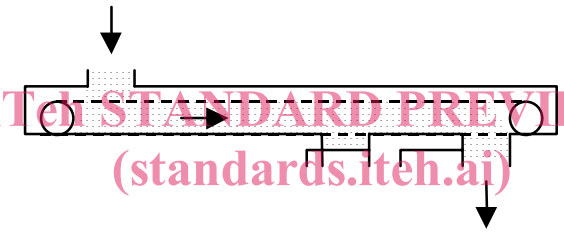

Figure 2

3.1.3
bucket elevator :
elevator for loose bulk materials with buckets as the carrying medium attached to a belt or chains as the driving medium (see Figure 3)

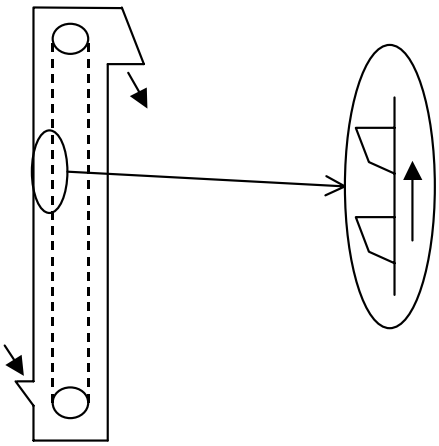

Figure 3

3.1.4
screw feeders / conveyors
conveyor for loose bulk materials with a trough or tube as the carrying medium, the material being moved by the action of a rotating screw. This screw can be rigid or flexible to take curves (see Figure 4)

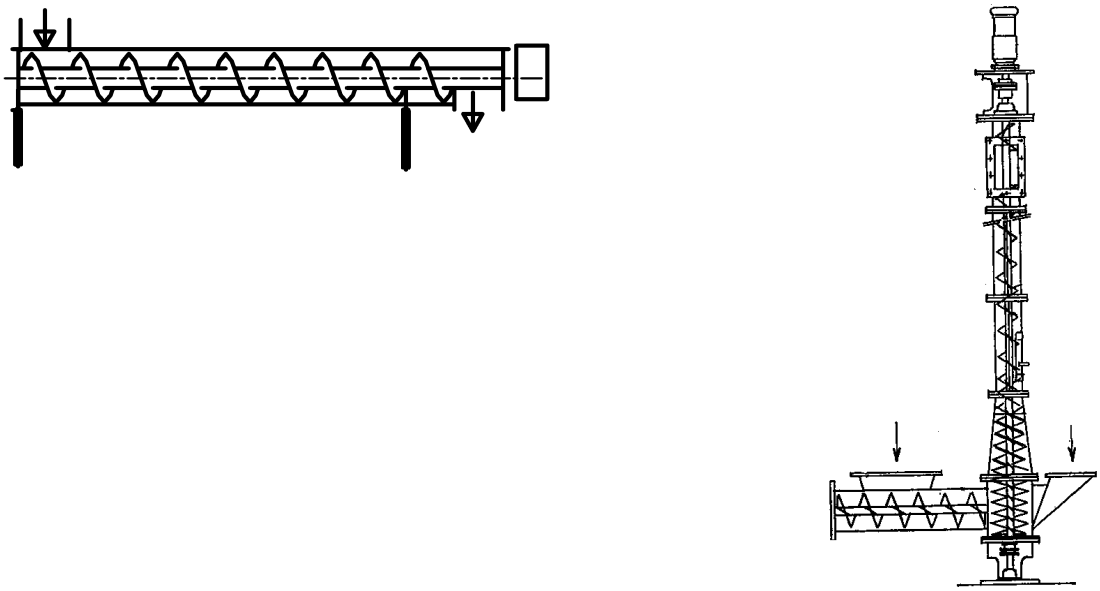

Figure 4

3.1.5
vibratory conveyor
conveyor for loose bulk materials which consists of a flexibly mounted trough or tube, in which the material moves under the effect of vibrations (see Figure 5)

Figure 5

3.1.6
rotarydrum, table or vane feeder
continuous volumetric dosing element within a housing consisting of a rotating shaft with several blades which transport the material from the inlet to the outlet (see Figure 6)

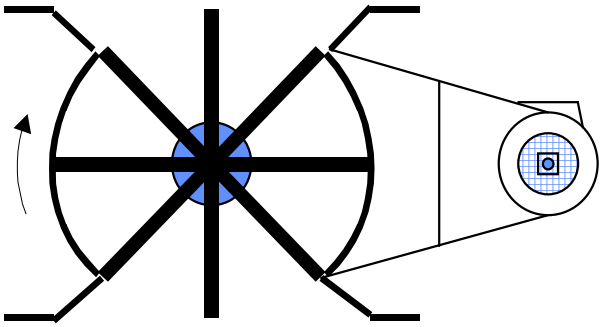

Figure 6

3.2
movable equipment
equipment generally intended to be moved only when out of operation (see Figure 7)

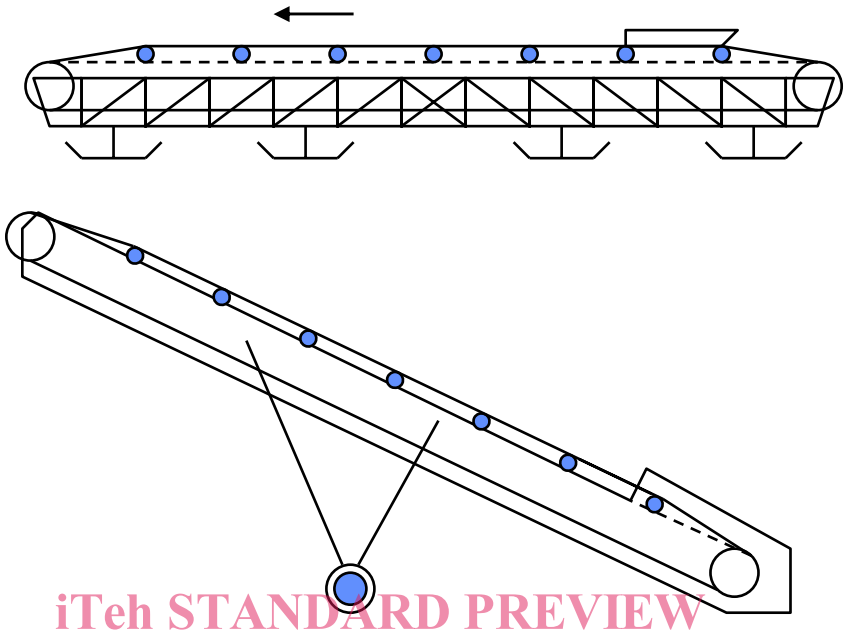

Figure 7

3.3
mobile equipment
equipment whose structure is self propelled during normal operation

3.3.1
stacker
mobile equipment on tracks (rails), crawlers or tyres for continuously piling or stacking bulk materials using unidirectional moving belts mounted on a boom as the final carrying and conveying medium (see Figure 8

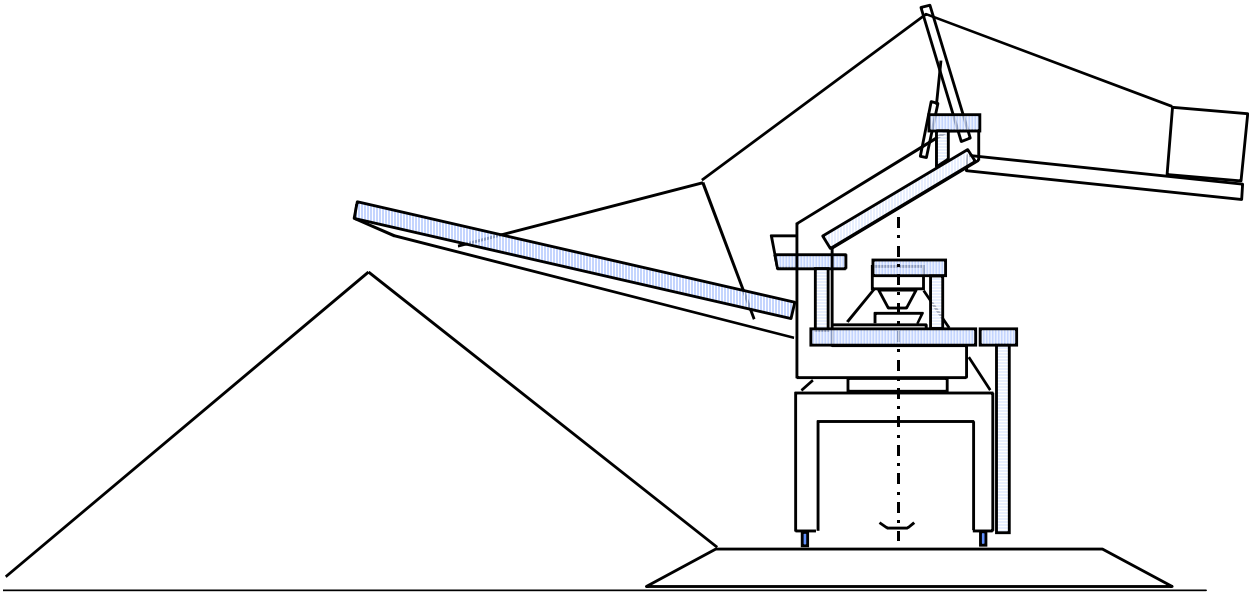

Figure 8

3.3.2
gantry stacker

mobile equipment mounted on a gantry travelling over the bulk material stack and along rail tracks, for continuously pileling or stacking bulk materials using endless moving belts as the carrying and conveying medium (see Figure 9)

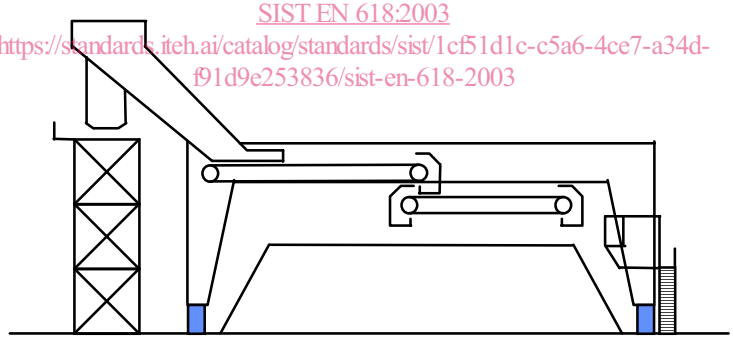

Figure 9

3.3.3
ship loader
mobile equipment travelling on rails or tyres for continuously loading a ship with bulk materials or bags of bulk materials (see Figure 10)

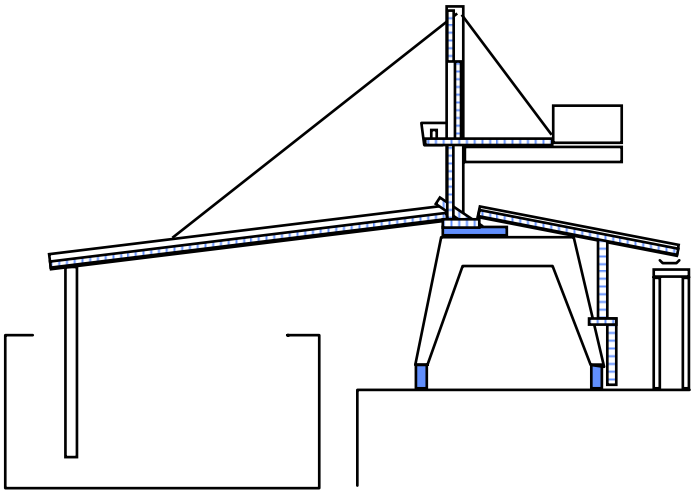

Figure 10

3.3.4
bucket-wheel reclaimer
mobile equipment on rails, crawlers or tyres used to reclaim continuously bulk materials, using a bucket wheel at the end of a boom and endless moving belts as the carrying and conveying medium (see Figure 11)

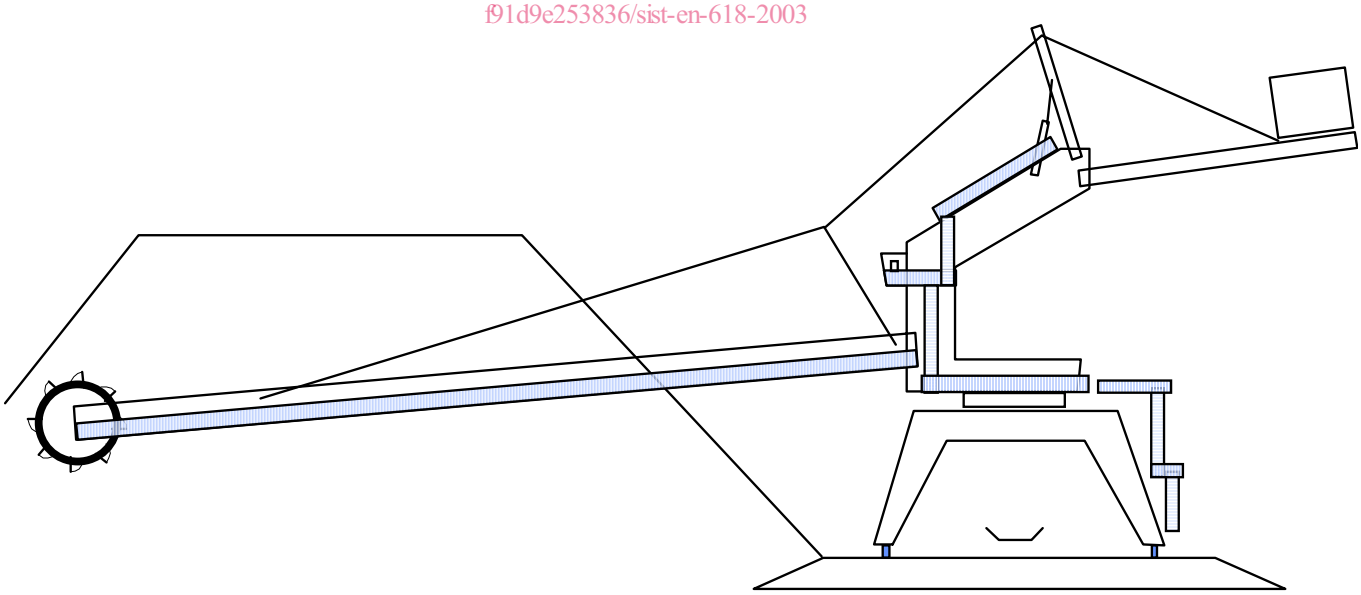

Figure 11