E02F

DREDGING; SOIL-SHIFTING (winning peat E21C 49/00)

Definition statement

This place covers:

- Primarily working vehicles or vessels (and occasionally stationary installations) for excavating or
  loosening earth and/or for moving loose earth on the ground or underwater, such as excavators,
  backhoes, loaders, graders, bulldozers, cable scrapers, bucket cars, suction dredgers, trenchers,
  and their methods of operation.
- In other rarer cases, similar working vehicles or vessels for working similarly on other materials,
  such as excavators with other kinds of tools such as breaking jaws, hammers, compactors, etc...
  instead of buckets, and such as rippers, and their methods of operation.
- Almost all the aspects of those particular working vehicles or vessels as defined above; the
  mechanical structures such as work implements, cabins, upper-structures, undercarriages, floating
  structures and drives: hydraulic, electric or in form of a combustion engine, and their control
  systems.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

<table>
<thead>
<tr>
<th>Category</th>
<th>CPC Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tractors (e.g. implements, couplers for tools)</td>
<td>A01B</td>
</tr>
<tr>
<td>Harvesting (e.g. hydraulic drive systems)</td>
<td>A01D</td>
</tr>
<tr>
<td>Manipulators (e.g. arms, control systems)</td>
<td>B25J</td>
</tr>
<tr>
<td>Vehicles in general (e.g. propulsion units, control thereof)</td>
<td>B60</td>
</tr>
<tr>
<td>Motor vehicles (e.g. undercarriages, super structures, cabins)</td>
<td>B62D</td>
</tr>
<tr>
<td>Tractors</td>
<td>B62D 49/00</td>
</tr>
<tr>
<td>Cranes (e.g. grapples, counterweights, hydraulic drive systems)</td>
<td>B66C</td>
</tr>
<tr>
<td>Fork lift trucks (e.g. hydraulic drive systems)</td>
<td>B66F</td>
</tr>
<tr>
<td>Machines for construction of roads (e.g. graders)</td>
<td>E01C 19/00, E01C 21/00, E01C 23/00</td>
</tr>
<tr>
<td>Street cleaning (e.g. graders for snow removal)</td>
<td>E01H</td>
</tr>
<tr>
<td>Stream regulation</td>
<td>E02B 3/02</td>
</tr>
<tr>
<td>Foundation slots, embankments</td>
<td>E02D</td>
</tr>
<tr>
<td>Drilling (e.g. particular work tools)</td>
<td>E21B</td>
</tr>
<tr>
<td>Mining (e.g. particular work tools)</td>
<td>E21C</td>
</tr>
<tr>
<td>Military vehicles (e.g. graders)</td>
<td>F41H</td>
</tr>
<tr>
<td>Control in general</td>
<td>G05</td>
</tr>
</tbody>
</table>

Special rules of classification

Some applications relating to soil-shifting as such, are also of interest for their general aspects and
need to be classified there in addition to the classification in E02F. Examples are:

- hydraulic drive system, classification also in F15B
- combustion engine control, classification also in F02D
- joint control of different sub-units of vehicles in general, classification also in B60K, B60W
• pivot joint, classification also in F16C
• superstructures, cabins, classification also in B62D 25/00 or B62D 33/00
• gearings, classification also in F16H.

Some documents (example: "working/industrial/construction machine such as excavators, cranes, fork lift trucks, tractors..."), with several application oriented disclosures, need to be classified in all the application subclasses (in the general subclass if appropriate, see paragraph above). Examples are:

• agricultural tractors or vehicles, classification also in A01B
• street cleaning (snow removal), classification also in E01H (E01H 5/00)
• cranes, classification also in B66C (cranes with a beam or boom B66C 23/00)
• fork lift trucks, classification also in B66F.

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

| Work implement | those parts that actually carry out the work of shifting soil and are attached to the vehicle or vessel body. For example: boom + dipper-arm + bucket. |

E02F 1/00

General working methods with dredgers or soil-shifting machines (methods for making embankments E02D 17/18; methods for mining E21C)

Definition statement

This place covers:

This group has to be considered as residual to all the other groups and subgroups of E02F. This group is very rarely used to classify documents.

References

Limiting references

This place does not cover:

| Dredgers; Soil-shifting machines | E02F 3/00 |
| Dredgers or soil-shifting machines for special purposes | E02F 5/00 |

E02F 3/00

Dredgers; Soil-shifting machines (for special purposes E02F 5/00; other machines or apparatus for mining E21C; tunnelling E21D)

Definition statement

This place covers:

the following vehicles or vessels, with their corresponding methods, their particular components and the drives and control systems specially adapted for each of those particular vehicles:
With digging screws (E02F 3/06)

WO2004/043832

With digging elements on an endless chain (E02F 3/08)

US3813125

With digging wheels turning round an axis (E02F 3/18)

FR1267198
With a pair of digging wheels, slotting machines (E02F 3/205)

EP1630301

With digging tools mounted on a single (bucket-) arm (E02F 3/283)

EP0445933
EP1294993
With digging tools mounted on a dipper-arm pivoted on a boom (E02F 3/30)

EP2141289
With digging tools mounted on a pair of bucket-arms (E02F 3/34)

GB859309 (pair of arms - 50 and 52)
With bucket-arms being pivoted at the rear of the vehicle chassis, skid steer loader (E02F 3/3414)

WO2009020509
With reciprocating digging or scraping elements moved by cables or hoisting ropes (E02F 3/46) with following subgroups:
  • with grab buckets for making foundation slots (E02F 3/475)
  • drag-lines (E02F 3/48)
  • with buckets or other digging elements moved along a rigid guideway (E02F 3/50)
• cableway excavators (E02F 3/52)
Bucket cars, i.e. having scraper bowls (E02F 3/64)

Graders, bulldozers (E02F 3/76) with the following subgroups:
- with the scraper blade mounted forwardly of the tractor on a pair of pivoting arms which are linked to the side of the tractors (E02F 3/7609)
- with the scraper blade mounted on a frame to be hitched to the tractor by bars, arms, chains or the like, the frame having no ground supporting means of its own (E02F 3/7622)
- with the scraper blade mounted under the tractors chassis (E02F 3/7636)
- with the scraper blade mounted under a frame supported by wheels (the frame being towed by a vehicle) (E02F 3/7663)
in exploded view

US2011067892 (arms 3, frame 4, blade 5)

DE2707006

GB2065749

With arrangements acting by a sucking or forcing effect, e.g. suction dredgers (E02F 3/88)
Special rules of classification

Boom or cantilever beam

dipper-arm

bucket or shovel

EP2141289 (boom 7, dipper-arm 8, bucket 9)

Bucket-arm(s)

WO2009020509 (bucket-arm(s) 24 could be single or double, with one on the other side of the vehicle)
E02F 3/02

This subgroup is of rare use. The spades and rakes for agriculture or gardening purposes are to be classified in A01B and not in this subgroup. Some documents overlap with E01H (street cleaning) or other subclasses.

E02F 3/205

for machines specialised in making foundation slots or making walls of concrete in situ:
- if the machine alone is described, the document is to be classified only in E02F 3/205.
- if the walls or foundations are defined and described too, the documents are also to be classified in E02D 17/13 or E02D 5/18.

E02F 3/301

E02F 3/302

E02F 3/303

E02F 3/304

E02F 3/305

E02F 3/306
Backhoe, construction machines wherein the tool mounted at the end of the dipper-arm and boom is pulled towards the machine (E02F 3/32)

EP2141289

Machine with a dipper-arm and boom working outwardly (E02F 3/308)

US6032093

E02F 3/3405

EP1775389
DE112007001547T

WO03069077 (assembly 60 - 63)

WO2011019143
WO2011019143 (locking element - which is also a hook - 13 acts on the pin 22)

EP1033447 (longitudinal locking element 11)

DE10200836 (hook 15 and transversal locking element 5 which enters 13 for locking)
EP2206837 (four movable pins - 16, 17)

CA2546034 (wedge 222')

US7086821 (snap-on function of locking element 40 because of the spring)
EP1033447 (first latching means 11 and second or redundant latching means 14)

DE102004014823 (hydraulic lines couplers 40 - at the right of the picture)

CN101268234
Buckets with integrated means for processing the soil are to be classified in E02F 3/407 and E02F 7/06, such as the following one:

EP2204501 (screening, crushing or mixing bucket)

Buckets with the particular integrated means "jaw crusher" for processing the soil are to be classified in E02F 3/407 and E02F 7/06 and E02F 3/965, such as the following one:

WO2011145233 (jaws 5 and 6)

E02F 3/43

Classification in subgroup(s) of this group is preferred above classification in this group.
WO9527832 (with jets)

WO2004065700 (with propeller)
suction wheels (E02F 3/9212 and subgroups)

WO2007100250 (with suction pipe 4 behind the wheel)
E02F 3/9243

WO9844078 (suction head 130)


Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

| Slidable vs telescopic | - slidable: an arm or a boom glides or slides as a whole piece along the axis of a support- telescopic: an arm or a boom is composed of several elements sliding within each other so that the arm or boom becomes longer or shorter |

E02F 3/08

with digging elements on an endless chain (conveyors B65G)

References

Limiting references

This place does not cover:

| Conveyors | B65G |

Informative references

Attention is drawn to the following places, which may be of interest for search:

| For digging trenches or ditches | E02F 5/06 |
Cutting machines for mining or quarrying

**E02F 5/00**

Dredgers or soil-shifting machines for special purposes

**Definition statement**

This place covers:

Machines used for uncovering conduits (E02F 5/003)

Trenchers (E02F 5/02 and subgroups)
- for laying cables (E02F 5/101)

US2007286681

Machines for making embankments or backfilling (E02F 5/22)
- for backfilling only (E02F 5/223)
- with means for processing the soil (E02F 5/226)
US4782606

US5097610

Machines for cleaning watercourses or other ways (E02F 5/28)

EP0259472

FIG.1

FR2789414
Rippers (E02F 5/32)

WO2007022579

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

<table>
<thead>
<tr>
<th>Embankments</th>
<th>E02D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laying pipes, making pipes in situ</td>
<td>F16L</td>
</tr>
<tr>
<td>Laying electric cables</td>
<td>H02G 1/06</td>
</tr>
</tbody>
</table>

Special rules of classification

E02F 5/22

for machines specialised in making embankments:

- if the machine alone is described, the document is to be classified only in E02F 5/22.
- if the embankment itself is defined, the document is also to be classified in E02D.

E02F 5/10, E02F 5/101

The documents concerning laying pipes, respectively laying electric cables are to be classified in F16L, respectively in H02G too. But the documents for laying drainage devices are only to be classified in E02F 5/10 or E02F 5/101 and not in E02B 11/02.

E02F 7/00

Equipment for conveying or separating excavated material (barges adapted for carrying-away material from floating dredgers B63B 35/28)

Definition statement

This place covers:

- conveying equipment, such as pipelines, conveyor belts or conveyor screws, etc, and delivery chutes or screening plants such as sieves, mixing machines, etc directly linked with excavation or dredging or soil-shifting machines.
- loading devices such as hoppers mounted on dredgers or excavators.
References

Informative references

Attention is drawn to the following places, which may be of interest for search:

<table>
<thead>
<tr>
<th>Topic</th>
<th>CPC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Separating solid from solid materials by sieving, screening</td>
<td>B07B</td>
</tr>
<tr>
<td>Conveyors, delivery chutes</td>
<td>B65G</td>
</tr>
<tr>
<td>Pipes in general</td>
<td>F16L</td>
</tr>
</tbody>
</table>

**E02F 7/005**

{conveying material from the underwater bottom (by pipelines E02F 7/10; suction dredgers E02F 3/88)}

**Definition statement**

This place covers:

![Diagram of underwater bottom conveyance system]
with a closer view of M below

**FIG. 5.**

US4010560

(often in combination with other classes, like subclasses of [E02F 3/88](#) or here in combination with subclasses of [E02F 3/08](#): "with digging elements on an endless chain")

### E02F 7/02

**Conveying equipment mounted on a dredger (conveyors in general [B65G](#))**

**References**

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

| In combination with digging elements mounted on an endless chain | E02F 3/082, E02F 3/083 |
| In combination with rotating digging wheels | [E02F 3/181](#) |
| In combination with bucket-arms | [E02F 3/348](#) |
| In combination with graders or bulldozers | [E02F 3/7695](#) |
| Conveyors in general | [B65G](#) |
E02F 7/026
{mounted on machines equipped with dipper- or bucket-arms}

Definition statement
This place covers:

US4196800
conveyor assembly 11 with front and rear sections 29 and 30 mounted on a machine equipped with a dipper arm structure 12

E02F 7/04
Loading devices mounted on a dredger or an excavator (loading devices in general B65G ){hopper dredgers, also equipment for unloading the hopper}

Definition statement
This place covers:
the soil hopper 30 is a loading device for the excavated soil (note: the document is also classified in E02F 7/026, as 33 is a conveying discharging soil means and in E02F 7/06 as 20 is a processing trough)
E02F 7/06

Delivery chutes or screening plants (or mixing plants) mounted on dredgers or excavators (for back-filling E02F 5/226 takes precedence); separating equipment in general B03; delivery chutes in general B65G

Definition statement

This place covers:

US6171030

the processing trough 20 mixes excavated soil - from hopper 30 - and an additive - from hopper 50 (note: the document is also classified in E02F 7/026, as 33 is a conveying discharging soil means and in E02F 7/04 as 30 is a hopper for loading excavated soil)
**E02F 7/10**

Pipelines for conveying excavated materials (pipes in general **F16L**; pipe-lines systems **F17D**; conveying by liquid pressure **B65G 53/30**)

**Definition statement**

This place covers:

![Diagram](image1)

WO9844207

conveyor pipeline for dumping dredged materials (note: the document is also classified in **E02F 7/023** conveying equipment mounted on a floating dredger)

**E02F 9/00**

Component parts of dredgers or soil-shifting machines, not restricted to one of the kinds covered by groups **E02F 3/00 - E02F 7/00** (laying-out or take-up devices for trailing electric cables **B66C**)

**Definition statement**

This place covers:

More particularly the devices for transporting the machines, and the following elements mounted on dredgers and soil-shifting machines not otherwise provided for in **E02F 3/00**, **E02F 5/00** and **E02F 7/00** and subgroups:

- pivot joint assemblies
- travelling-gear or undercarriages, for caterpillars for instance
- floating substructures
- superstructures and their supports
- slewing or traversing gears, such as turntables
- cabins
• counterweights
• drives, control systems of particular purposes, electric or hydraulic or pneumatic control devices not covered by other groups in E02F
• safety devices not covered by other groups in E02F
• indicating devices, like displays
• small wearing parts, like teeth or tips.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

| Travelling gears, caterpillars, undercarriages | B60B, B61F, B62D |
| Suspensions in vehicles | B60G |
| Control of several sub-units in vehicles | B60K, B60W |
| Engine control | F02D |
| Control of hydraulic pumps | F04B |
| Hydraulic systems | F15B |
| Pivots, bearings | F16C |
| Gearings | F16H |

Special rules of classification

E02F 9/022

E02F 9/028

E02F 9/04

WO2004098985 (walking gears 4)
Spuds ([E02F 9/062](#))

WO2006130934 (spuds 3 and 4)

US6041527

([E02F 9/067](#)) (to compensate the influence of the waves)

GB1521185

([E02F 9/0841](#))
All inventions disclosing hydraulic circuits have to be classified in one of the classes E02F 9/2203 - E02F 9/226 and in the appropriate subgroups of E02F 9/2278.

All inventions disclosing hydraulic circuits with one or more accumulators have to be classified in E02F 9/2217.

**Glossary of terms**

*In this place, the following terms or expressions are used with the meaning indicated:*

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slewing or revolving or swing structure</td>
<td>Part of the vehicle frame which rotate about a vertical axis</td>
</tr>
<tr>
<td>FOPS</td>
<td>Falling Object Protection Structure</td>
</tr>
<tr>
<td>ROPS</td>
<td>Roll Over Protection Structure</td>
</tr>
</tbody>
</table>