

# CPC COOPERATIVE PATENT CLASSIFICATION

## E FIXED CONSTRUCTIONS

### BUILDING

## E02 HYDRAULIC ENGINEERING; FOUNDATIONS; SOIL SHIFTING

## E02F DREDGING; SOIL-SHIFTING ([winning peat E21C 49/00](#))

### NOTE

This subclass covers :

- primarily equipment for excavating or loosening earth or for moving loose earth;
- equipment for working similarly on other materials and similar equipment for loading or unloading materials

### WARNINGS

- The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:

[E02F 3/39](#)

covered by

[E02F 3/286](#), [E02F 3/306](#), [E02F 3/3402](#)

[E02F 3/85](#)

covered by

[E02F 3/841](#), [E02F 3/842](#), [E02F 3/844](#),  
[E02F 3/845](#), [E02F 3/847](#)

- In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

<b>1/00</b>	<b>General working methods with dredgers or soil-shifting machines</b> ( <a href="#">methods for making embankments E02D 17/18</a> ; <a href="#">methods for mining E21C</a> )	3/142	. . . . .	{tools mounted on buckets or chains which loosen the soil, e.g. cutting wheels, or the like ( <a href="#">teeth per se E02F 9/28</a> )}
<b>3/00</b>	<b>Dredgers; Soil-shifting machines</b> ( <a href="#">for special purposes E02F 5/00</a> ; <a href="#">other machines or apparatus for mining E21C</a> ; <a href="#">tunnelling E21D</a> )	3/143	. . . . .	{chains; chain links; scraper chains ( <a href="#">chains or chain guides E21C 25/28</a> )}
3/02	. hand-operated {; <a href="#">handheld soil shifting equipment acting by sucking E02F 3/8891</a> ( <a href="#">spades or rakes for agriculture or gardening purposes A01B</a> )}	3/144	. . . . .	{emptying or cleaning the buckets, e.g. in combination with spoil removing equipment}
3/04	. mechanically-driven	3/145	. . . . .	{drives}
3/045	. . {with oscillating digging tools, e.g. oscillating spades}	3/146	. . . . .	{guides for chains or buckets, e.g. for buckets movable relative to chains ( <a href="#">chains or chain guides E21C 25/28</a> )}
3/06	. . with digging screws {( <a href="#">earth drilling E21</a> ; <a href="#">for digging trenches or ditches E02F 5/04</a> )}	3/147	. . . . .	{arrangements for the co-operation between buckets or buckets and wheels}
3/08	. . with digging elements on an endless chain ( <a href="#">conveyors B65G</a> )	3/148	. . . . .	{wheels, sprockets}
3/081	. . . {mounted on floating substructures ( <a href="#">floating substructures per se E02F 9/06</a> )}	3/16	. . . . .	Safety or control devices ( <a href="#">safety devices in general F16P</a> ; <a href="#">controlling in general G05</a> )
3/082	. . . {including a belt-type conveyor for transporting the excavated material}	3/18	. . . . .	with digging wheels turning round an axis {, e.g. bucket-type wheels ( <a href="#">for digging trenches E02F 5/08</a> ; <a href="#">for laying cables underwater E02F 5/109</a> ; <a href="#">cutting machines E21C 25/00</a> ; <a href="#">methods or apparatus for making tunnels or galleries E21D 9/00</a> )}
3/083	. . . {including a screw-type conveyor for transporting the excavated material}	3/181	. . . . .	{including a conveyor}
3/085	. . . {with auxiliary or additional digging elements other than digging elements on an endless chain}	3/183	. . . . .	{with digging unit shiftable relative to the frame}
3/086	. . . {vertically shiftable relative to the frame}	3/185	. . . . .	{with digging unit mounted in a plane which is inclined to the direction of travel; with tools digging laterally with respect to the frame}
3/087	. . . {with digging unit working in a plane inclined to the direction of travel}	3/186	. . . . .	{with the axis being substantially parallel to the direction of travel}
3/088	. . . {pivotable relative to the frame}	3/188	. . . . .	{with the axis being horizontal and transverse to the direction of travel}
3/10	. . . with tools that only loosen the material {, i.e. with cutter-type chains}	3/20	. . . . .	with tools that only loosen the material {, i.e. mill-type wheels}
3/12	. . . Component parts {, e.g. bucket troughs}			
3/14	. . . . Buckets; Chains; Guides for buckets or chains; Drives for chains			
3/141	. . . . . {buckets}			

- 3/205 . . . . {with a pair of digging wheels, e.g. slotting machines (implements for making foundation slots with definition of the walls or foundations [E02D 17/13](#); bulkheads or similar walls made solely of concrete [in situ E02D 5/18](#); with a pair of buckets [E02F 3/475](#))}
- 3/22 . . . . Component parts
- 3/24 . . . . Digging wheels; Digging elements of wheels; Drives for wheels
- 3/241 . . . . . {digging wheels}
- 3/243 . . . . . {wheels rotatable in both directions}
- 3/245 . . . . . {with digging elements mounted movable relative to the wheel}
- 3/246 . . . . . {drives}
- 3/248 . . . . . {Cleaning the wheels or emptying the digging elements mounted on the wheels, e.g. in combination with spoil removing equipment}
- 3/26 . . . . Safety or control devices (safety devices in general [F16P](#); controlling in general [G05B](#))
- 3/28 . . with digging tools mounted on a dipper- or bucket-arm {, i.e. there is either one arm or a pair of arms}, e.g. dippers, buckets
- 3/283 . . . {with a single arm pivoted directly on the chassis (linkage mechanism for it [E02F 3/3405](#))}
- 3/286 . . . . {telescopic or slidable (fork-lift trucks with a telescopic boom [B66F 9/0655](#))}
- 3/30 . . . with a dipper-arm pivoted on a cantilever beam {, i.e. boom}
- 3/301 . . . . {with more than two arms (boom included), e.g. two-part boom with additional dipper-arm}
- 3/302 . . . . {with an additional link}
- 3/303 . . . . {with the dipper-arm or boom rotatable about its longitudinal axis}
- 3/304 . . . . {with the dipper-arm slidably mounted on the boom ([E02F 3/305](#) takes precedence)}
- 3/305 . . . . {with the dipper-arm slidably mounted on the boom and the boom slidably mounted on the frame}
- 3/306 . . . . {with telescopic dipper-arm or boom}
- 3/307 . . . . {the boom and the dipper-arm being connected so as to permit relative movement in more than one plane}
- 3/308 . . . . {working outwardly}
- 3/32 . . . . working downwardly and towards the machine, e.g. with backhoes
- 3/325 . . . . . {Backhoes of the miniature type}
- 3/34 . . . with bucket-arms {, i.e. a pair of arms, e.g. manufacturing processes, form, geometry, material of bucket-arms (with a single arm [E02F 3/283](#))} directly pivoted on the frames of tractors or self-propelled machines
- 3/3402 . . . . {the arms being telescopic (fork-lift trucks with a telescopic boom [B66F 9/0655](#))}
- 3/3405 . . . . {and comprising an additional linkage mechanism}
- 3/3408 . . . . . {of the parallelogram-type}
- 3/3411 . . . . . {of the Z-type}
- 3/3414 . . . . {the arms being pivoted at the rear of the vehicle chassis, e.g. skid steer loader}
- 3/3417 . . . . {Buckets emptying by tilting ([E02F 3/342](#), [E02F 3/345](#) take precedence)}
- 3/342 . . . . Buckets emptying overhead ([E02F 3/348](#) - [E02F 3/358](#) take precedence)
- 3/345 . . . . Buckets emptying side-ways ([E02F 3/348](#) - [E02F 3/358](#) take precedence)
- 3/348 . . . . Buckets emptying into a collecting or conveying device
- 3/3483 . . . . . {Buckets discharging on a conveyor or elevator mounted on the machine}
- 3/3486 . . . . . {Buckets discharging overhead into a container mounted on the machine}
- 3/352 . . . . Buckets movable along a fixed guide
- 3/355 . . . . Buckets connected to the rear end of a tractor {not used}
- 3/358 . . . . Bucket-arms pivoted on a turntable being part of a tractor frame {or buckets arranged on a turntable supported by the arms}
- 3/36 . . . . Component parts
- 3/3604 . . . . {Devices to connect tools to arms, booms or the like}
- 3/3609 . . . . . {of the quick acting type, e.g. controlled from the operator seat (quick-acting couplers to connect booms or arms to tractors [E02F 3/627](#); quick-acting couplers for machines mounted on tractor [A01B 59/06](#); couplings of the quick-acting type per se [F16L 37/00](#))}
- 3/3613 . . . . . {with means for absorbing any play therebetween ([E02F 3/364](#) takes precedence)}
- 3/3618 . . . . . {with two separating hooks}
- 3/3622 . . . . . {with a hook and a locking element acting on a pin}
- 3/3627 . . . . . {with a hook and a longitudinal locking element}
- 3/3631 . . . . . {with a hook and a transversal locking element}
- 3/3636 . . . . . {using two or four movable transversal pins}
- 3/364 . . . . . {using wedges}
- 3/3645 . . . . . {with auto-engagement means for automatic snap-on of the tool coupler part}
- 3/365 . . . . . {with redundant latching means, e.g. for safety purposes}
- 3/3654 . . . . . {with energy coupler, e.g. coupler for hydraulic or electric lines, to provide energy to drive(s) mounted on the tool}
- 3/3659 . . . . . {electrically-operated}
- 3/3663 . . . . . {hydraulically-operated}
- 3/3668 . . . . . {where engagement is effected by a mechanical lever or handle}
- 3/3672 . . . . . {where disengagement is effected by a mechanical lever or handle}
- 3/3677 . . . . . {allowing movement, e.g. rotation or translation, of the tool around or along another axis as the movement implied by the boom or arms, e.g. for tilting buckets}
- 3/3681 . . . . . {Rotators}
- 3/3686 . . . . . {using adapters, i.e. additional element to mount between the coupler and the tool}

- 3/369 . . . . {Devices to connect parts of a boom or an arm (devices to connect booms or arms to tractors [E02F 3/627](#))}
- 3/3695 . . . . {Arrangements for connecting dipper-arms to loaders or graders}
- 3/38 . . . . Cantilever beams {, i.e. booms; e.g. manufacturing processes, forms, geometry or materials used for booms (for booms with cable suspension arrangements [E02F 9/14](#) takes precedence)}; Dipper-arms {, e.g. manufacturing processes, forms, geometry or materials used for dipper-arms}; Bucket-arms {([E02F 3/34](#) takes precedence)}
- 3/382 . . . . {Connections to the frame; Supports for booms or arms (devices to connect booms or arms to tractors or similar machines [E02F 3/627](#); pivot joint assemblies in particular [E02F 9/006](#))}
- 3/384 . . . . . {the boom being pivotable relative to the frame about a vertical axis}
- 3/386 . . . . . {the boom being laterally shiftable relative to the frame}
- 3/388 . . . . . {Mechanical locking means for booms or arms against rotation, e.g. during transport of the machine (transporting-cranes [B66C 23/344](#))}
- 3/40 . . . . Dippers; Buckets {; Grab devices, e.g. manufacturing processes for buckets, form, geometry or material of buckets (devices to connect tools to arms or booms [E02F 3/3604](#); teeth therefor [E02F 9/28](#))}
- 3/401 . . . . . {Buckets or forks comprising, for example, shock absorbers, supports or load striking scrapers to prevent overload}
- 3/402 . . . . . {with means for facilitating the loading thereof, e.g. conveyors}
- 3/404 . . . . . {comprising two parts movable relative to each other, e.g. for gripping}
- 3/405 . . . . . {using vibrating means (blades or levelling tools with vibrating teeth [E02F 3/8155](#); vibrating rippers [E02F 5/326](#))}
- 3/407 . . . . . with ejecting {or other unloading} device
- 3/4075 . . . . . {Dump doors; Control thereof}
- 3/413 . . . . . with grabbing device ({[E02F 3/404](#) takes precedence; with grab buckets moved by cables or hoisting ropes [E02F 3/47](#); grab equipment for cranes [B66C](#))}
- 3/4131 . . . . . {mounted on a floating substructure (floating substructures per se [E02F 9/06](#))}
- 3/4133 . . . . . {grabs carried out as loaders or mounted on a tractor}
- 3/4135 . . . . . {with grabs mounted directly on a boom}
- 3/4136 . . . . . {with grabs mounted on a slidable or telescopic boom or arm}
- 3/4138 . . . . . {the grab being emptied by flushing}
- 3/42 . . . . Drives for dippers, buckets, dipper-arms or bucket-arms
- 3/422 . . . . . {Drive systems for bucket-arms, front-end loaders, dumpers or the like}
- 3/425 . . . . . {Drive systems for dipper-arms, backhoes or the like}
- 3/427 . . . . . {with mechanical drives (by cables or hoisting ropes [E02F 3/46](#) take precedence)}
- 3/43 . . . . . Control of dipper or bucket position; Control of sequence of drive operations
- 3/431 . . . . . {for bucket-arms, front-end loaders, dumpers or the like}
- 3/432 . . . . . {for keeping the bucket in a predetermined position or attitude}
- 3/433 . . . . . {horizontal, e.g. self-levelling}
- 3/434 . . . . . {providing automatic sequences of movements, e.g. automatic dumping or loading, automatic return-to-dig}
- 3/435 . . . . . {for dipper-arms, backhoes or the like}
- 3/436 . . . . . {for keeping the dipper in the horizontal position, e.g. self-levelling}
- 3/437 . . . . . {providing automatic sequences of movements, e.g. linear excavation, keeping dipper angle constant}
- 3/438 . . . . . {Memorising movements for repetition, e.g. play-back capability}
- 3/439 . . . . . {Automatic repositioning of the implement, e.g. automatic dumping, auto-return ([E02F 3/438](#) takes precedence)}
- 3/46 . . with reciprocating digging or scraping elements moved by cables or hoisting ropes {; Drives or control devices therefor ([E02F 3/205](#), [E02F 3/905](#) take precedence)}
- 3/47 . . . with grab buckets (grab equipment for cranes [B66C](#))
- 3/475 . . . . {for making foundation slots (slotting machines with a pair of digging wheels [E02F 3/205](#))}
- 3/48 . . . Drag-lines
- 3/50 . . . with buckets or other digging elements moved along a rigid guideway
- 3/52 . . . Cableway excavators (cable cranes [B66C](#))
- 3/54 . . . Cable scrapers ({[E02F 3/48](#), [E02F 3/52](#) take precedence)}
- 3/56 . . . . with hand-controlled scraper or other digging elements
- 3/58 . . . Component parts ({[E02F 9/14](#), [E02F 3/905](#) take precedence)}
- 3/60 . . . . Buckets, scrapers, or other digging elements
- 3/627 . . Devices to connect beams or arms to tractors or similar self-propelled machines, {e.g. drives therefor (connection of beams or booms or arms to the frame per se [E02F 3/382](#); connection of scraper bowls to the vehicle main body [E02F 3/653](#); connecting devices for agriculture tractors [A01B 59/06](#))}
- 3/6273 . . . {using legs to support the beams or arms on the ground during the connecting process}
- 3/6276 . . . {on one side of the frame}
- 3/633 . . . Drives therefor {(not used, see [E02F 3/627](#))}
- 3/64 . . Buckets cars, i.e. having scraper bowls ({for cable scrapers [E02F 3/54](#) takes precedence; soil working machines in agriculture [A01B](#))}
- 3/6409 . . . {Self-propelled scrapers}
- 3/6418 . . . . {with rotatable scraper bowls for dumping the soil (with only elements of the scraper bowls being pivotable [E02F 3/6427](#))}

- 3/6427 . . . . {with elements of the scraper bowls being pivotable for dumping the soil ([E02F 3/6445](#) take precedence; with an ejector having translational movement [E02F 3/6436](#))}
- 3/6436 . . . . {with scraper bowls with an ejector having translational movement for dumping the soil ([E02F 3/6445](#) takes precedence)}
- 3/6445 . . . . {with conveying means for emptying the scraper bowl}
- 3/6454 . . . {Towed (i.e. pulled or pushed) scrapers}
- 3/6463 . . . . {with rotatable scraper bowls for dumping the soil (with only elements of the scraper bowls being pivotable [E02F 3/6472](#))}
- 3/6472 . . . . {with elements of the scraper bowls being pivotable for dumping the soil ([E02F 3/649](#) takes precedence; with an ejector having translational movement [E02F 3/6481](#))}
- 3/6481 . . . . {with scraper bowls with an ejector having translational movement for dumping the soil ([E02F 3/649](#) takes precedence)}
- 3/649 . . . . {with conveying means for emptying the scraper bowl}
- 3/65 . . . Component parts, e.g. drives, control devices
- 3/651 . . . . {Hydraulic or pneumatic drives; Electric or electro-mechanical control devices ([E02F 3/652](#), [E02F 3/653](#) take precedence)}
- 3/652 . . . . {Means to adjust the height of the scraper bowls, e.g. suspension means, tilt control, earth damping control}
- 3/653 . . . . {Connection mechanisms to the main body of the machine (connection of tools to dipper-arms, booms, bucket-arms [E02F 3/3604](#); connection of beams or booms or arms to tractors in general [E02F 3/627](#))}
- 3/654 . . . . {Scraper bowls and components mounted on them}
- 3/655 . . . . . {Loading or elevator mechanisms (loading devices for excavators in general [E02F 7/04](#))}
- 3/656 . . . . . {Ejector or dumping mechanisms (for buckets mounted on a dipper-arm or bucket arms [E02F 3/407](#))}
- 3/657 . . . . . {Means to prevent the spilling of dredged material, e.g. apron, baffle}
- 3/658 . . . . . {Cutting edge (for graders or bulldozer blades [E02F 3/8152](#), [E02F 3/8155](#); teeth per se [E02F 9/28](#))}
- 3/659 . . . . . {Conveying means for emptying scraper bowls (conveying equipment for excavators in general [E02F 7/02](#))}
- 3/76 . . . Graders, bulldozers, or the like with scraper plates or ploughshare-like elements ([soil-working A01B](#)); Levelling {scarifying} devices {(street cleaning [E01H](#); construction of roads [E01C 19/00](#), [E01C 23/00](#))}
- 3/7604 . . . {Combinations of scraper blades with soil loosening tools working independently of scraper blades (soil loosening attachments fixed on blades [E02F 3/8152](#), [E02F 3/8155](#))}
- 3/7609 . . . {Scraper blade mounted forwardly of the tractor on a pair of pivoting arms which are linked to the sides of the tractor, e.g. bulldozers}
- 3/7613 . . . . {with the scraper blade adjustable relative to the pivoting arms about a vertical axis, e.g. angle dozers}
- 3/7618 . . . . {with the scraper blade adjustable relative to the pivoting arms about a horizontal axis}
- 3/7622 . . . {Scraper equipment 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, e.g. drag scrapers}
- 3/7627 . . . . {with the scraper blade adjustable relative to the frame about a vertical axis}
- 3/7631 . . . . {with the scraper blade adjustable relative to the frame about a horizontal axis}
- 3/7636 . . . {Graders with the scraper blade mounted under the tractor chassis}
- 3/764 . . . . {with the scraper blade being pivotable about a vertical axis}
- 3/7645 . . . . {with the scraper blade being pivotable about a horizontal axis disposed parallel to the blade}
- 3/765 . . . . {with the scraper blade being pivotable about a horizontal axis disposed perpendicular to the blade}
- 3/7654 . . . . {with the scraper blade being horizontally movable into a position near the chassis}
- 3/7659 . . . . {with the vertical centre-line of the scraper blade disposed laterally relative to the central axis of the chassis}
- 3/7663 . . . {Graders with the scraper blade mounted under a frame supported by wheels, or the like}
- 3/7668 . . . . {with the scraper blade being pivotable about a vertical axis}
- 3/7672 . . . . {with the scraper blade being pivotable about a horizontal axis disposed parallel to the blade}
- 3/7677 . . . . {with the scraper blade being pivotable about a horizontal axis disposed perpendicular to the blade}
- 3/7681 . . . . {with the scraper blade being horizontally movable into a position near the frame}
- 3/7686 . . . . {with the vertical centre-line of the scraper blade disposed laterally relative to the central axis of the frame}
- 3/769 . . . {Graders, bulldozers, or the like comprising loaders}
- 3/7695 . . . {Graders, bulldozers or the like comprising elevators or conveyors}
- 3/78 . . . with rotating digging elements
- 3/783 . . . . {having a horizontal axis of rotation}
- 3/786 . . . . {having a vertical axis of rotation}
- 3/80 . . . Component parts
- 3/815 . . . . Blades; Levelling {or scarifying} tools ([E02F 3/40](#) takes precedence)}
- 3/8152 . . . . . {Attachments therefor, e.g. wear resisting parts, cutting edges ([E02F 3/8155](#), [E02F 3/8157](#) take precedence; teeth per se [E02F 9/28](#))}
- 3/8155 . . . . . {provided with movable parts, e.g. cutting discs, vibrating teeth or the like}
- 3/8157 . . . . . {Shock absorbers; Supports, e.g. skids, rollers; Devices for compensating wear-and-tear, or the like}



- 3/84 . . . . Drives or control devices therefor {, e.g. hydraulic drive systems}
- 3/841 . . . . . {Devices for controlling and guiding the whole machine, e.g. by feeler elements and reference lines placed exteriorly of the machine ([construction of roads E01C 19/008](#))}
- 3/842 . . . . . {using electromagnetic, optical or photoelectric beams, e.g. laser beams}
- 3/844 . . . . . {for positioning the blade, e.g. hydraulically}
- 3/845 . . . . . {using mechanical sensors to determine the blade position, e.g. inclinometers, gyroscopes, pendulums}
- 3/847 . . . . . {using electromagnetic, optical or acoustic beams to determine the blade position, e.g. laser beams}
- 3/848 . . . . . {using cable drums}
- 3/88 . . with arrangements acting by a sucking or forcing effect, e.g. suction dredgers ([pumps in general F04](#))
- 3/8808 . . . {Stationary installations, e.g. installations using spuds or other stationary supports ([spuds on floating substructures per se E02F 9/062; cleaning the beds of waterways E02B 3/02](#))}
- 3/8816 . . . {Mobile land installations}
- 3/8825 . . . . {wherein at least a part of the soil-shifting equipment is mounted on a dipper-arm, backhoes or the like}
- 3/8833 . . . {Floating installations ([floating substructures per se E02F 9/06](#))}
- 3/8841 . . . . {wherein at least a part of the soil-shifting equipment is mounted on a ladder or boom}
- 3/885 . . . . {self propelled, e.g. ship}
- 3/8858 . . . {Submerged units ([self propelled units for burying conduits or cables in trenches under water E02F 5/105](#))}
- 3/8866 . . . . {self propelled}
- 3/8875 . . . . {pulled or pushed}
- 3/8883 . . . {Using the force of explosions, e.g. by the use of internal combustion engines}
- 3/8891 . . . {wherein at least a part of the soil-shifting equipment is handheld}
- 3/90 . . . Component parts {, e.g. arrangement or adaptation of pumps}
- 3/902 . . . . {for modifying the concentration of the dredged material, e.g. relief valves preventing the clogging of the suction pipe}
- 3/905 . . . . {Manipulating or supporting suction pipes or ladders; Mechanical supports or floaters therefor; pipe joints for suction pipes ([for heave compensation E02F 9/067 takes precedence; pipelines per se E02F 7/10; joints for pipes in general F16L](#))}
- 3/907 . . . . {Measuring or control devices, e.g. control units, detection means or sensors ([E02F 3/902 takes precedence](#))}
- 3/92 . . . . Digging elements, e.g. suction heads
- 3/9206 . . . . . {Digging devices using blowing effect only, like jets or propellers ([E02F 5/107 takes precedence; passive suction heads with jets E02F 3/925; active suction heads with jets E02F 3/9262; drilling by jets E21B 7/18; slitting by jets E21C 25/60](#))}
- 3/9212 . . . . . {Mechanical digging means, e.g. suction wheels, i.e. wheel with a suction inlet attached behind the wheel ([E02F 3/9287 takes precedence; active suction heads E02F 3/9256](#))}
- 3/9218 . . . . . {with jets}
- 3/9225 . . . . . {with rotating cutting elements}
- 3/9231 . . . . . {Suction wheels with axis of rotation parallel to longitudinal axis of the suction pipe}
- 3/9237 . . . . . {Suction wheels with axis of rotation in transverse direction of the longitudinal axis of the suction pipe}
- 3/9243 . . . . . {Passive suction heads with no mechanical cutting means ([E02F 5/108 takes precedence](#))}
- 3/925 . . . . . {with jets}
- 3/9256 . . . . . {Active suction heads; Suction heads with cutting elements, i.e. the cutting elements are mounted within the housing of the suction head ([E02F 5/108 takes precedence](#))}
- 3/9262 . . . . . {with jets}
- 3/9268 . . . . . {with rotating cutting elements}
- 3/9275 . . . . . {with axis of rotation parallel to longitudinal axis of the suction pipe}
- 3/9281 . . . . . {with axis of rotation in horizontal and transverse direction of the suction pipe}
- 3/9287 . . . . . {Vibrating suction heads}
- 3/9293 . . . . . {Component parts of suction heads, e.g. edges, strainers for preventing the entry of stones or the like}
- 3/94 . . . . Apparatus for separating stones from the dredged material {, i.e. separating or treating dredged material ([screening plants mounted on dredger therefor E02F 7/06](#))}
- 3/945 . . . . . {for environmental purposes}
- 3/96 . . with arrangements for alternate {or simultaneous} use of different digging elements {([E02F 3/7604, E02F 3/769, E02F 3/78 take precedence; quick-acting devices to connect tools to arms or booms E02F 3/3609, for arms to tractors or the like E02F 3/627](#))}
- 3/961 . . . {with several digging elements or tools mounted on one machine ([for backhoes E02F 3/964 takes precedence](#))}
- 3/962 . . . {Mounting of implements directly on tools already attached to the machine ([E02F 3/404 and E02F 3/8152 take precedence](#))}
- 3/963 . . . {Arrangements on backhoes for alternate use of different tools ([backhoes per se E02F 3/30; quick-acting devices to connect tools to arms E02F 3/3609, for arms to tractors or the like E02F 3/627](#))}
- 3/964 . . . . {of several tools mounted on one machine ([E02F 3/962 takes precedence](#))}
- 3/965 . . . {of metal-cutting or concrete-crushing implements ([shearing devices B23D 17/00; wrecking of buildings, e.g. tools therefor, E04G 23/08](#))}
- 3/966 . . . {of hammer-type tools ([arrangements for breaking-up hard ground E02F 5/305; percussion -type rippers E02F 5/323](#))}

- 3/967 . . . {of compacting-type tools (compacting tools in combination with special-purpose dredges or soil-shifting machines [E02F 5/30](#))}
- 3/968 . . . {Storing, handling or otherwise manipulating tools when detached from the machine ([E02F 3/6273](#) takes precedence)}
- 5/00 Dredgers or soil-shifting machines for special purposes**
- 5/003 . {for uncovering conduits}
- 5/006 . {adapted for working ground under water not otherwise provided for ([E02F 3/081](#), [E02F 3/4131](#), [E02F 3/8833](#), [E02F 5/104](#), [E02F 5/125](#), [E02F 7/005](#), [E02F 7/023](#), [E02F 7/065](#), [E02F 9/026](#), [E02F 9/045](#), [E02F 9/06](#) take precedence)}
- 5/02 . for digging trenches or ditches ({machines for making foundation slots [E02F 3/205](#), [E02F 3/475](#) take precedence}; agricultural ploughs for working ridges [A01B 13/02](#))
- 5/022 . . {with tools digging laterally with respect to the frame}
- 5/025 . . {with scraper-buckets, dippers or shovels}
- 5/027 . . {with coulters, ploughs, scraper plates, or the like ([E02F 5/102](#), [E02F 5/103](#), [E02F 5/106](#) take precedence)}
- 5/04 . . with digging screws {([E02F 5/109](#) takes precedence; with digging screws [per se](#) [E02F 3/06](#))}
- 5/06 . . with digging elements mounted on an endless chain {([E02F 5/109](#) takes precedence; with digging elements mounted on an endless chain [per se](#) [E02F 3/08](#))}
- 5/08 . . with digging wheels turning round an axis {([E02F 5/109](#) takes precedence; with digging wheels [per se](#) [E02F 3/18](#))}
- 5/10 . . with arrangements for reinforcing trenches or ditches; with arrangements for making or assembling conduits or for laying conduits or cables (laying pipes [per se](#) [F16L 1/00](#), making pipes in situ [F16L 1/038](#); laying electric cables [per se](#) [H02G 1/06](#); {drainage device- laying apparatus [E02B 11/02](#)})
- 5/101 . . . {forming during digging, e.g. underground canalizations or conduits, by bending or twisting a strip of pliable material; by extrusion}
- 5/102 . . . {operatively associated with mole-ploughs, coulters (rippers [E02F 5/32](#))}
- 5/103 . . . . {with oscillating or vibrating digging tools}
- 5/104 . . . {for burying conduits or cables in trenches under water (floating substructures [per se](#) [E02F 9/06](#))}
- 5/105 . . . . {self-propulsed units moving on the underwater bottom}
- 5/106 . . . . {using ploughs, coulters, rippers}
- 5/107 . . . . {using blowing-effect devices, e.g. jets (digging devices using a blowing effect [per se](#) [E02F 3/9206](#))}
- 5/108 . . . . {using suction-effect devices (suction heads [per se](#) [E02F 3/9243](#), [E02F 3/9256](#))}
- 5/109 . . . . {using rotating digging elements (rotating digging elements [per se](#) [E02F 3/18](#))}
- 5/12 . . with equipment for back-filling trenches or ditches
- 5/125 . . . {underwater}
- 5/14 . . Component parts for trench excavators, e.g. indicating devices {travelling gear chassis, supports, skids}
- 5/145 . . . {control and indicating devices}
- 5/16 . Machines for digging other holes in the soil (earth drilling [E21](#))
- 5/18 . . for horizontal holes {or inclined holes}
- 5/20 . . for vertical holes
- 5/22 . for making embankments; for back-filling (in combination with trench excavators [E02F 5/12](#))
- 5/223 . . {for back-filling (in association with trench excavators [E02F 5/12](#))}
- 5/226 . . . {with means for processing the soil, e.g. screening belts, separators; Padding machines}
- 5/24 . . Depositing dredged material in mounds
- 5/26 . . Combined conveying-bridges and dredgers
- 5/28 . for cleaning watercourses or other ways {(stream regulation [E02B 3/02](#))}
- 5/282 . . {with rotating cutting or digging tools}
- 5/285 . . {with drag buckets or scraper plates}
- 5/287 . . {with jet nozzles (digging devices with blowing effect [per se](#) [E02F 3/9206](#))}
- 5/30 . Auxiliary apparatus, e.g. for thawing, cracking, blowing-up, or other preparatory treatment of the soil
- 5/305 . . {Arrangements for breaking-up hard ground ([E02F 5/32](#) takes precedence; hammer-type tools [E02F 3/966](#); breaking-up paving of roads or the like [E01C 23/12](#); breaking-up subaqueous rock [E02B 3/02](#))}
- 5/32 . . Rippers {([E02F 5/106](#) takes precedence, ripper or scarifying teeth mounted on blades [E02F 3/8152](#); ripper tips [E02F 9/2875](#))}
- 5/323 . . . {Percussion-type rippers}
- 5/326 . . . {oscillating or vibrating}
- 7/00 Equipment for conveying or separating excavated material (barges adapted for carrying-away material from floating dredgers [B63B 35/28](#))**
- 7/005 . {conveying material from the underwater bottom (by pipelines [E02F 7/10](#); suction dredgers [E02F 3/88](#))}
- 7/02 . Conveying equipment mounted on a dredger (conveyors in general [B65G](#))
- 7/023 . . {mounted on a floating dredger}
- 7/026 . . {mounted on machines equipped with dipper- or bucket-arms}
- 7/04 . Loading devices mounted on a dredger or an excavator (loading devices in general [B65G](#)) {hopper dredgers, also equipment for unloading the hopper}
- 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](#))
- 7/065 . . {mounted on a floating dredger}
- 7/10 . Pipelines for conveying excavated materials (pipes in general [F16L](#); pipe-lines systems [F17D](#) ; conveying by liquid pressure [B65G 53/30](#))}

- 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](#))**
- 9/003 . {Devices for transporting the soil-shifting machines or excavators, e.g. by pushing them or by hitching them to a tractor}
- 9/006 . {Pivot joint assemblies (in general [F16C 11/04](#))}
- 9/02 . Travelling-gear, e.g. associated with slewing gears ({drives therefor [E02F 9/20](#)}; for motor vehicles [B60B](#), [B60G](#); undercarriages for locomotives or railroad cars [B61F](#); track-laying vehicles [B62D](#); for cranes [B66C 23/18](#))
- 9/022 . . {for moving on rails}
- 9/024 . . {with laterally or vertically adjustable wheels or tracks (for vehicles in general [B60B 35/10](#); [B62D 55/084](#))}
- 9/026 . . {for moving on the underwater bottom (marine propulsion by direct engagement with water-bed or ground [B63H 19/08](#))}
- 9/028 . . {with arrangements for levelling the machine (hydraulic drives therefor [E02F 9/2257](#))}
- 9/04 . . Walking gears moving the dredger forward step-by-step
- 9/045 . . . {for moving on the underwater bottom (for artificial islands [E02B 17/022](#); marine propulsion by direct engagement with water-bed or ground [B63H 19/08](#))}
- 9/06 . Floating substructures as supports {(floating installations with arrangements acting by a sucking or forcing effect [E02F 3/8833](#))}
- 9/062 . . {Advancing equipment, e.g. spuds for floating dredgers}
- 9/065 . . . {characterised by the use of lines with anchors and winches}
- 9/067 . . {with arrangements for heave compensation (for drilling structures [E21B 19/09](#); for lifting devices [B66C 13/02](#))}
- 9/08 . Superstructures; Supports for superstructures {(arrangements for travelling gear, e.g. undercarriages for wheels, crawlers, caterpillars [E02F 9/02](#); for motor vehicles [B62D 25/00](#), [B62D 33/00](#))}
- 9/0808 . . {Improving mounting or assembling, e.g. frame elements, disposition of all the components on the superstructures (for disposition of specific components, [E02F 9/0858](#))}
- 9/0816 . . . {Welded frame structure}
- 9/0825 . . . {Cast frame structure}
- 9/0833 . . {Improving access, e.g. for maintenance, steps for improving driver's access, handrails}
- 9/0841 . . {Articulated frame, i.e. having at least one pivot point between two travelling gear units (tractor-trailer combinations [B62D 53/00](#))}
- 9/085 . . {Ground-engaging fitting for supporting the machines while working, e.g. outriggers, legs (for vehicles in general [B60S 9/00](#), for cranes [B66C 23/78](#))}
- 9/0858 . . {Arrangement of component parts installed on superstructures not otherwise provided for, e.g. electric components, fenders, air-conditioning units ([E02F 9/16](#), [E02F 9/18](#) take precedence)}
- 9/0866 . . . {Engine compartment, e.g. heat exchangers, exhaust filters, cooling devices, silencers, mufflers, position of hydraulic pumps in the engine compartment}
- 9/0875 . . . {Arrangement of valve arrangements on superstructures (arrangement of hydraulic hoses [E02F 9/2275](#) takes precedence; valves per se [E02F 9/2267](#))}
- 9/0883 . . . {Tanks, e.g. oil tank, urea tank, fuel tank (for vehicles in general [B60K 15/00](#))}
- 9/0891 . . . {Lids or bonnets or doors or details thereof (doors for cabins [E02F 9/163](#) takes precedence; for motor vehicles [B62D 25/10](#))}
- 9/10 . . Supports for movable superstructures mounted on travelling or walking gears or on other superstructures
- 9/12 . . . Slewing or traversing gears (roller and ball bearings [F16C](#))
- 9/121 . . . . {Tumtables, i.e. structure rotatable about 360°}
- 9/123 . . . . . {Drives or control devices specially adapted therefor ([E02F 9/125](#) and [E02F 9/128](#) take precedence)}
- 9/125 . . . . . {Locking devices}
- 9/126 . . . . . {Lubrication systems}
- 9/128 . . . . . {Braking systems}
- 9/14 . Booms {only for booms with cable suspension arrangements (for booms or manipulators with cable suspensions for suction pipes [E02F 3/905](#) takes precedence; for booms per se [E02F 3/38](#); [E02F 3/34](#) for bucket-arms)}; Cable suspensions
- 9/16 . Cabins, platforms, or the like, for drivers ({for motor vehicles in general [B62D 33/06](#)}, for cranes [B66C 13/54](#))
- 9/163 . . {Structures to protect drivers, e.g. cabins, doors for cabins; Falling object protection structure [FOPS]; Roll over protection structure [ROPS] (for handrails mounted on cabins [E02F 9/0833](#) takes precedence; for vehicles in general [B60R 21/11](#), [B60R 21/13](#), for fork-lift trucks [B66F 9/07545](#))}
- 9/166 . . {movable, tiltable or pivoting, e.g. movable seats, dampening arrangements of cabins (seats for vehicles in general [B60N 2/00](#))}
- 9/18 . Counterweights {(for cranes [B66C 23/72](#), for tractors [B62D 49/085](#))}
- 9/20 . Drives; Control devices (gearings in general [F16H](#); controlling in general [G05](#); electric multi-motor drives [H02K](#), [H02P](#))
- 9/2004 . . {Control mechanisms, e.g. control levers (control levers per se [G05G](#))}
- 9/2008 . . . {Control mechanisms in the form of the machine in the reduced scale model}
- 9/2012 . . . {Setting the functions of the control levers, e.g. changing assigned functions among operations levers, setting functions dependent on the operator or seat orientation}
- 9/2016 . . {Winches (winches per se [B66D](#))}
- 9/202 . . {Mechanical transmission, e.g. clutches, gears (clutches per se [F16D](#), gears per se [F16H](#))}
- 9/2025 . . {Particular purposes of control systems not otherwise provided for ([E02F 3/16](#), [E02F 3/26](#), sub-groups of [E02F 3/43](#), [E02F 3/651](#), sub-groups of [E02F 3/84](#), [E02F 3/907](#), [E02F 5/145](#) take precedence)}

- 9/2029 . . . {Controlling the position of implements in function of its load, e.g. modifying the attitude of implements in accordance to vehicle speed (control for hydraulic or pneumatic drives [E02F 9/2203](#), [E02F 9/2221](#) and [E02F 9/2253](#) take precedence)}
- 9/2033 . . . {Limiting the movement of frames or implements, e.g. to avoid collision between implements and the cabin (sub-groups of [E02F 3/431](#) of [E02F 3/435](#) take precedence; for turntables [E02F 9/123](#))}
- 9/2037 . . . {Coordinating the movements of the implement and of the frame}
- 9/2041 . . . {Automatic repositioning of implements, i.e. memorising determined positions of the implement (for dipper-arms or bucket-arms [E02F 3/434](#), [E02F 3/437](#), [E02F 3/438](#), [E02F 3/439](#) take precedence)}
- 9/2045 . . . {Guiding machines along a predetermined path (for graders [E02F 3/841](#); machines for construction of roads [E01C 19/004](#))}
- 9/205 . . . {Remotely operated machines, e.g. unmanned vehicles ([E02F 3/8866](#) takes precedence)}
- 9/2054 . . . {Fleet management}
- 9/2058 . . {Electric or electro-mechanical or mechanical control devices of vehicle sub-units (for vehicles in general [B60W](#))}
- 9/2062 . . . {Control of propulsion units (for control of the prime mover depending on the load in a hydraulic or pneumatic drive [E02F 9/2246](#))}
- 9/2066 . . . . {of the type combustion engines}
- 9/207 . . . . {of the type electric propulsion units, e.g. electric motors or generators}
- 9/2075 . . . . {of the hybrid type (for vehicles in general [B60W 20/00](#))}
- 9/2079 . . . {Control of mechanical transmission (for hydrostatic transmission or hydraulic torque converter [E02F 9/2253](#))}
- 9/2083 . . . {Control of vehicle braking systems}
- 9/2087 . . . {Control of vehicle steering (for steering with hydraulic or pneumatic drives [E02F 9/225](#))}
- 9/2091 . . . {Control of energy storage means for electrical energy, e.g. battery or capacitors (energy recovery arrangements in hydraulic or pneumatic drives [E02F 9/2217](#))}
- 9/2095 . . . {Control of electric, electro-mechanical or mechanical equipment not otherwise provided for, e.g. ventilators, electro-driven fans (control of hydraulic driven equipment [E02F 9/22](#))}
- 9/22 . . Hydraulic or pneumatic drives {(for dipper or bucket arm position control [E02F 3/43](#), for blade position control for graders [E02F 3/844](#); for turntables [E02F 9/121](#); for fork-lift trucks [B66F 9/22](#))}
- 9/2203 . . . {Arrangements for controlling the attitude of actuators, e.g. speed, floating function}
- 9/2207 . . . . {for reducing or compensating oscillations}
- 9/221 . . . . {for generating actuator vibration (buckets with vibrating means [E02F 3/405](#))}
- 9/2214 . . . . {for reducing the shock generated at the stroke end}
- 9/2217 . . . {with energy recovery arrangements, e.g. using accumulators, flywheels}
- 9/2221 . . . {Control of flow rate; Load sensing arrangements ([E02F 9/2203](#) take precedence over [E02F 9/2221](#))}
- 9/2225 . . . . {using pressure-compensating valves}
- 9/2228 . . . . . {including an electronic controller}
- 9/2232 . . . . {using one or more variable displacement pumps}
- 9/2235 . . . . . {including an electronic controller}
- 9/2239 . . . . {using two or more pumps with cross-assistance}
- 9/2242 . . . . . {including an electronic controller}
- 9/2246 . . . {Control of prime movers, e.g. depending on the hydraulic load of work tools}
- 9/225 . . . {Control of steering, e.g. for hydraulic motors driving the vehicle tracks (steering in general [B62D](#))}
- 9/2253 . . . {Controlling the travelling speed of vehicles, e.g. adjusting travelling speed according to implement loads, control of hydrostatic transmission}
- 9/2257 . . . {Vehicle levelling or suspension systems (suspensions for vehicles in general [B60G](#))}
- 9/226 . . . {Safety arrangements, e.g. hydraulic driven fans, preventing cavitation, leakage, overheating}
- 9/2264 . . . {Arrangements or adaptations of elements for hydraulic drives}
- 9/2267 . . . . {Valves or distributors (position of valves arrangements on upper-structures [E02F 9/0875](#))}
- 9/2271 . . . . {Actuators and supports therefor and protection therefor}
- 9/2275 . . . . {Hoses and supports therefor and protection therefor}
- 9/2278 . . . {Hydraulic circuits}
- 9/2282 . . . . {Systems using center bypass type changeover valves}
- 9/2285 . . . . . {Pilot-operated systems}
- 9/2289 . . . . . {Closed circuit}
- 9/2292 . . . . {Systems with two or more pumps}
- 9/2296 . . . . {Systems with a variable displacement pump}
- 9/24 . . Safety devices {, e.g. for preventing overload ([E02F 9/226](#) takes precedence)}
- 9/245 . . {for preventing damage to underground objects during excavation, e.g. indicating buried pipes or the like (detection of pipes in the ground [F16L 1/11](#))}
- 9/26 . . Indicating devices {([E02F 5/145](#) takes precedence)}
- 9/261 . . {Surveying the work-site to be treated}
- 9/262 . . . {with follow-up actions to control the work tool, e.g. controller}
- 9/264 . . {Sensors and their calibration for indicating the position of the work tool}
- 9/265 . . . {with follow-up actions (e.g. control signals sent to actuate the work tool)}
- 9/267 . . {Diagnosing or detecting failure of vehicles}
- 9/268 . . . {with failure correction follow-up actions}
- 9/28 . . Small metalwork for digging elements, e.g. teeth {scraper bits (ploughs for agriculture [A01B 15/00](#); teeth of harrows [A01B 23/02](#))}
- 9/2808 . . {Teeth}
- 9/2816 . . . {Mountings therefor}
- 9/2825 . . . . {using adapters}



## E02F

- 9/2833 . . . . {Retaining means, e.g. pins}
- 9/2841 . . . . . {resilient}
- 9/285 . . . {characterised by the material used}
- 9/2858 . . . {characterised by shape}
- 9/2866 . . {for rotating digging elements (for milling machines [B28D 1/186](#); for mining machines [E21C 35/18](#))}
- 9/2875 . . {Ripper tips}
- 9/2883 . . {Wear elements for buckets or implements in general}
- 9/2891 . . {Tools for assembling or disassembling}